Massachusetts Medical Society

THE SHATTUCK LECTURE.

THE FUNCTION OF THE SPLEEN WITH PARTICULAR REFERENCE TO HEMOLYSIS AND THE HEMOLYTIC ANEMIAS.*

BY HERBERT C. MOFFITT, M.D., SAN FRANCISCO.

THE spleen has always been a subject of interest and speculation; at one period in ancient times it was regarded as the seat of laughter, at another as the source of bad temper and melancholy. *Aristotle* (384-322 B.C.) regarded as its chief function the withdrawal of unnecessary moisture from the stomach—a foreshadowing of the more modern theory, of a regulating mechanism for the digestive blood supply. He was probably the first to suggest that the spleen was not absolutely necessary for the preservation of the life of animals, though there is no evidence that his suggestion rested upon any firmer basis than speculation. It is interesting to note, in view of the hyposthenic function assumed by Banti in certain cases of splenomegaly, that it has been recorded that the Romans occasionally removed spleens in gladiators to increase their strength and endurance. In *Pliny* (A.D. 23-79) one may read of the spleen that "This member hath a property by itself sometimes, to hinder a man's running; whereupon professed runners in the race that be troubled with the splene have a desire to burn and waste it with a hot iron and no marvel, for why? they say that the splene may be taken out of the bodie by way of incision and yet the creature live nevertheless; but if it be man or woman that be thus cut for the splene hee or shee loseth their laughing by the means. For sure it is that intemperate laughers have alwaies great splenes." *Galen* (130 A.D.) referred to the mystery of its function and mentioned, what has been recorded by more than one modern author, that with enlargement of the spleen bleeding from the left nostril was a common symptom. *Philagrios* of Epirus, writing toward the end of the fourth century, was long regarded as an authority on diseases of the spleen and was quoted later by *Actius, Alexander* of Tralles and *Rhazes.* He described the association of splenomegaly with abdominal distention and recognized the splenic tumor of malaria and infectious diseases. *Harvey* (1578-1657) and his pupils extirpated the spleen in dogs and found that the animals continued to live apparently in perfect condition, and in the end of the seventeenth century *Malpighi,* likewise experimenting with dogs, noted the regeneration of splenic tissue in the peritoneum in some cases after splenectomy. *Thomison,* in the first century, described extirpation and cauterization of the spleen in man but his observations are probably no more authentic than the accounts of splenectomy in gladiators. In the sixteenth century *Fioravanti* recorded an instance of an accidental splenectomy following a stab wound of the abdomen. A little later he referred for operation a patient with a greatly enlarged spleen to the Neapolitan Zaccarrello, a famous cutter for stone. Proper advertisement of the successful operation was effected by exposing the spleen in the shop of a well-known merchant for three days. In 1581 *Viard* saw a case in which the spleen had escaped through a wound severing the false ribs; he tied the vessels and removed the organ successfully. These are probably the first authentic splenectomies.

After antisepsis and asepsis came to rob surgery of its dangers, removal of the spleen ceased to be a rare operation and frequent opportunity was afforded to study the effects of its loss on the general economy. The fact was abundantly confirmed that the normal and diseased organ could be removed with little or no apparent effect upon the general health. It was recognized, moreover, by pathologists that the spleen is occasionally absent congenitally without obvious influence upon development or function. *Hodenpyl* collected ten such instances and *Sternberg* and *Glinski* have each added an additional case. On the other hand it was found occasionally both in animals and in man that after splenectomy a regeneration of splenic tissue took place in various parts of the abdominal cavity. *Von Stubenrauch* in a second laparotomy one year after removal of a ruptured spleen observed numbers of small bodies the size of peas scattered in the mesentery and omentum, with a structure between that of lymph glands or hemolymph glands and spleen. Similar observations have been recorded by *Kostjurin, Benecke, Faltin, Albrecht* and others. The supplementary function of accessory spleens has been frequently noted after splenectomy or in splenic disease, and it is interesting to find that accessory spleens have been described as occurring more commonly in those regions in which splenic enlargements are most often observed. Thus *Giesker* and *Rosenmüller* found them frequently in autopsies upon southern Europeans, whereas the incidence in northern Germany is recorded as only one in four hundred.

I. THE RELATION OF THE SPLEEN TO BLOOD FORMATION AND TO THE BONE MARROW.

Since recognition of the fact that only red-blooded animals have spleens, the interest in the

* The Shattuck Lecture delivered before The Massachusetts Medical Society at Boston, June 9, 1914.

NOTE.—At an adjourned meeting of The Massachusetts Medical Society held Oct. 3, 1860, it was

Resolved, "That The Massachusetts Medical Society hereby declares that it does not consider itself as having endorsed or censured the opinions in former published Annual Discourses, nor will it hold itself responsible for any opinions or sentiments advanced in any future similar discourse."

Resolved, "That the Committee On Publications be directed to print a statement to that effect at the commencement of each Annual Discourse which may hereafter be published."

relation of the organ to blood formation has naturally been great. In the human embryo there can be no question of the production of erythrocytes in the spleen, but there can be no question also that this production ceases at birth and that in later life the spleen is normally not concerned in the regeneration of red cells. Pathologically there may be extensive areas of myeloid metaplasia, as in myeloid leukemia, with actively dividing megaloblasts and normoblasts which may be added to the blood stream. The small foci of myeloid metaplasia so frequently seen in the spleens of pernicious anemia or of infectious disease have little influence on the production of erythrocytes, and are rarely of clinical interest. *Milne*, in dealing with the experimental production of myeloid changes in the spleen and other organs observes that probably most of the new-formed tissue is made up of endothelial proliferation and that the new-formed cells do not, except in small part, represent erythroblasts. The clinical importance of the splenomegaly due to myeloid transformation in cases of generalized aleukemic myelosis will be considered later in connection with the splenomegaly of certain atypical cases of pernicious anemia. Undoubtedly we must regard the bone-marrow as practically the sole source of the red blood cells in post-natal existence. With the leucocytes, however, the conditions are different. It is not yet certain whether there are irreconcilable differences between myeloblasts and lymphocytes or whether at times the granular leucocytes may be evolved from lymphocytes. Probably in the spleen lymphocytes have their origin in the adenoid tissue of the follicles and the granular forms are produced in the pulp. There can be little doubt that leucocytes are normally added to the circulation from the spleen; *Kölliker* and *Ebner* found many more leucocytes in the splenic vein than in the splenic artery. After manipulation at operation, during the contractions accompanying digestion, after injection of pilocarpin numbers of lymphocytes are added to the circulation from the spleen. The large mononuclears (splenocytes) formed in the spleen probably do not enter the blood stream but remain sessile and serve as a partial source of hemolysins; the macrophagocytes likewise do not enter the general circulation. The leukopenia very frequently observed in splenic disease may be due in part to the failure of the organ to add the usual number of lymphocytes and perhaps of other forms to the blood stream. There is reason to believe, however, that even normally the spleen exercises a certain degree of inhibition upon the bone-marrow, influencing the formation and addition to the circulation of both red and white cells. In disease this inhibition may be increased and may lead to anemia and leukopenia, thus Banti is inclined to refer the anemia characterizing his disease partly to the difficulty of hemoglobin synthesis and partly to a pathological retention of erythrocytes in the marrow. *Lethaus* observed the development of a polycythemia (10-11,000,000 erythrocytes and 150% Hgb.), after removal of a ruptured spleen in a man of 39. He thought of some unknown function of the spleen regulating hematopoiesis through a hormone or through nervous influence; if this regulating influence was removed by operation the bone marrow was unduly irritated and great numbers of normal and immature cells were thrown into the circulation. Polycythemia has been noted also by *Küttner* and by *Roughton* and *Legg* after removal of normal spleens accidentally ruptured, and by *Schupfer*, *Levison* and *Mühsam* after splenectomy for relief of Banti's disease (cited in the article by G. Klemperer and H. Hirschfeld). Usually, however, after splenectomy there is little or no change in the red cells, but a marked polynuclear leucocytosis occurs, lasting a few days or a few weeks and gradually giving place to a normal count with relative eosinophilia. After splenectomy in dogs *Musser* and *Krumbhaar* constantly found an anemia reaching its height in three to six weeks and approaching normal again in five to ten months, and *Bayer's* experiments on dogs give results identical with these. (*Von Decastello* and *Biedl* noted the frequent appearance of Howell-Jolly bodies after splenectomy in dogs.) *G. Klemperer* was led to advocate splenectomy in pernicious anemia in the hope of influencing favorably bone-marrow regeneration and the tremendous medullary reactions after the operation in many cases of pernicious anemia have formed the subject of numerous recent papers. Blood platelets which are as a rule much diminished in pernicious anemia increase greatly after operation and lymphocytic leukopenia gives place to a neutrophilic leucocytosis. Pain in the long bones after splenectomy has been observed by Löhlein, Ballance, Bovée, Heaton, Simpson; it is probably associated with increased medullary activity and *Regnier* four months after splenectomy amputated a lower extremity and found red marrow throughout the femur.

II. THE RELATION OF THE SPLEEN TO IRON METABOLISM.

From work done in very recent times by Asher and his pupils Grossenbacher and Zimmermann, by Schmidt, Vogel, and Bayer it seems probable that the spleen is a depot for iron derived from destruction of blood and tissue cells and that the liver stores the iron coming to the body in the food. After splenectomy there is marked reduction of erythrocytes and hemoglobin when the animals receive but little iron in the food, and rapid improvement when iron is added (Bayer). Hemoglobin determinations both by the liquid and dry methods have shown that normally there is a higher content in the blood from the splenic vein than from the carotid (Middendorf, Darjuvitsch). Banti has confirmed these observations both experiment-

ally and in clinical cases, but even with this authority any one who has attempted similar determinations will be doubtful of their accuracy and import. When large amounts of pigment and iron-containing pigment are found in the spleen according to William Hunter they denote "not an increased but a slower hemolysis—not recent death, but an honored old age (with decent burial in the spleen) of the red corpuscles concerned." Increased siderosis in the spleen may be an indication, therefore, of general tissue-cell destruction and may be found in cases of ulcerative tuberculosis in cirrhosis of the liver, etc. Increase of iron-bearing pigment in the liver and kidneys is, on the other hand characteristic of active or hemolytic processes and particularly of active hemolysis in the spleen.

III. THE RELATION OF THE SPLEEN TO DIGESTION.

Through its power of contractility, afforded by the content in smooth muscle and elastic fibres the spleen may vary its store of blood considerably and may perhaps have some influence upon stomach and liver hyperemia. The occurrence of gastric hemorrhage after splenectomy is well known. There is no clinical or experimental evidence to support the views that pepsin and trypsin are not properly elaborated in absence of the spleen and the theory of a tonic inhibition of the intestine through the autonomic nervous system has been evolved from a few clinical observations alone. After removal of the spleen in Banti's disease, in pernicious anemia and in hemolytic icterus improvement in appetite and disappearance of gastric distress and vomiting have been noted in a number of instances.

IV. THE RELATION OF THE SPLEEN TO THE DUCTLESS GLANDS, LYMPH GLANDS AND HEMOLYMPH GLANDS.

The thymus occasinally enlarges after splenectomy and perhaps may compensate for the loss of lymphocytic production in the spleen; enlargement of the thyroid has also been observed. The lymph and hemolymph glands are often involved in infections or general diseases like lymphogranulomatosis, pernicious anemia, leukemia which affect the speen as well. In animals after splenectomy the formation of many new hemolymph glands has been noted by Tizzoni, Wimogradow, Mosler, and Warthin, and more rarely enlargement of the peripheral lymph glands has been recorded after splenectomy in man. *Pearce* and *Austin* have observed an increase of endothelial cells in the lymph glands after splenectomy in dogs and have found that these cells become phagocytes for red cells after the injection of hemolytic sera, compensating for the erythrocytolysis of the spleen and the failure of splenectomy to benefit certain cases of pernicious anemia has been referred by Eppinger to the increased hemolytic activity of numerous new-formed hemolymph glands. On account of the vascularization of lymph glands which follows splenectomy it has been proposed in the Wiener Frauenklinik to remove the spleen in cancer operations in order to prevent glandular metastases.

V. THE SPLEEN AND INFECTIONS.

Owing to the hyperemia and enlargement in the course of most infectious diseases the spleen has enjoyed a certain reputation as a power for good in the struggle with infection. There is no evidence, however, to show that immune bodies are more favorably developed in the spleen than in other organs. *Lewis* and *Margot* investigating the function of the spleen in experimental infection in white rats and mice, found that rats and mice surviving after intraperitoneal injections of cultures of tubercle bacilli had big spleens. But they found that even greater resistance to general infection after intraperitoneal injections was shown by the animals after splenectomy. No such changes in resistance to infection were observed in guinea-pigs or dogs. Patients without spleens have gone through successfully such infections as typhoid, pneumonia, empyema, acute articular rheumatism. A patient of *Brewer* recovered from typhoid but after splenectomy had a relapse which proved fatal.

VI. THE RELATION OF THE SPLEEN TO NEOPLASMS.

Remarkably interesting work has recently been done by *Murphy* in the Rockefeller Institute in regard to the defensive mechanism of the spleen in the chick against implantation of heteroplastic tissue. Rat sarcoma can be grown freely in chick embryos but only until the spleen begins to develop. If a piece of adult spleen be planted in the embryo the same resistance to invasion by foreign tissue is established. Murphy concludes his article by saying: "Whatever the various functions of the spleen may be, these experiments show conclusively that when that organ in the adult state is supplied, the embryo chick otherwise subject to heterotransplantation becomes as resistant as the adult animal to growth of alien tissues. Hence the spleen and, to a less extent, the bone-marrow provide a defensive mechanism that prevents the development of foreign tissues in the chick embryo." The spleen is rarely the seat of primary or secondary carcinoma or sarcoma. *Oser* and *Pribam* have shown that injection of spleen emulsion into rats with tumors leads to retrogressive changes in the growths and they as well as *Apolant* have demonstrated in animals a decreased resistance to tumor implantation after splenectomy. *Carrel* (The Production of Antibodies by Tissues Living Outside the Organism) has found that connective tissue growth is activated to the greatest degree by embryonic tissue extract and next in order by extract from the adult spleen (of dogs). A case of Eppinger may be mentioned in this

connection. A man of 46 had the spleen removed in April, 1913, because of a Banti Symptom Complex. The rectum had been examined and found normal but six weeks later a large tumor was present. Evidently the tumor grew rapidly after the splenectomy.

VII. THE RELATION OF THE SPLEEN TO HEMOLYSIS.

Normally there is a remarkable balance between hemolysis and hematopoiesis. The bone-marrow reacts delicately to increased CO_2 tension of the blood, to the products of erythrocytic disintegration, to many chemical and infective agents, and is held in check possibly, as we have seen above, by an inhibitory influence of the spleen which may prevent the entrance into the blood stream of immature forms or excessive numbers of erythrocytes. It is difficult to determine the average life of a red cell; Quincke estimates it at two or three weeks, Brugsch and Retzlaff at 20 days, Latschenberger from experiments on animals at 12 days, Hofmeister at 50 days. Normally there is little if any active hemolysis of erythrocytes in the general circulation but their slow destruction is effected in the spleen, liver and marrow—particularly in the spleen—by means of autolysis and phagocytosis. The iron of the corpuscles is changed to an albuminate of iron and deposited probably in greatest part in the spleen to be used later in the elaboration of new erythrocytes and hemoglobin. The spleen, however, is not an indispensable agent in this degradation and elaboration of hemoglobin, as *Gilbert, Chabrol* and *Bénard* have shown that the absence of the spleen does not limit the power of the liver to transform hemoglobin into bile or bile derivatives. McNee would refer to the Küppfer cells of the liver the function of splitting off the iron containing part of the blood coloring matter. The amount of bile pigment produced daily has been accepted as the best measure of the degradation and destruction of erythrocytes. *Eppinger* making use of the experiments of Stadelmann on dogs has computed that approximately .5 grm. bilirubin is produced in the body daily. A normal man of 70 kgm. has about 3600 cc. of blood. This corresponds to 504 grams hemoglobin or 20 grams hematin, 20 grams hematin equalling 18 of bilirubin. The .5 gms. bilirubin produced daily represents then the destruction of about 100 cc. blood and the entire blood of the body, according to this calculation of Eppinger, would be renewed every 36 days. *Widal, Guillain* and *Troisier,* and recently *Whipple* and *Hooper* have doubted the correctness of the present belief that bile pigment is derived solely from the hemoglobin of the red blood cells and that the transformation occurs only in the liver. Whipple and Hooper think it possible that the liver cells may elaborate bile from substances not derivates of hemoglobin, and that hemoglobin transformation may be effected by cells outside the liver.

Eppinger lays great stress upon the value of urobilin excretion in urine and stool as a measure of the degree of hemolysis, although he realizes clearly that many uncertain factors play a part both in the formation and elimination of urobilin and that its determination is only of relative and approximate value. With *Charnas* he has elaborated a method of determining urobilinogen in the stool and their quantitative results show plainly the value of the procedure in estimating the activity of blood destruction in various hemolytic anemias. In the normal adult .12 to .15 gm. urobilin is excreted daily in the stool. Pathologically the highest figures are observed in hemolytic icterus, polycythemia, pneumonia, hypertrophic cirrhosis, marked passive congestion, lead poisoning, malaria and pernicious anemia; 3 or 4 grams daily may be eliminated in hemolytic icterus. Eppinger regards a high urobilin content of the stool in pernicious anemia as the determining clinical factor in advising splenectomy. The advice appended to this is interesting: "Für diejenigen die nicht in der Lage sind, dies zu ermitten, möchte ich empfehlen sich mit der Qualität des Duodenalsaftes zu begnügen." *Eppinger* and *King* have shown that the iodin content of the blood and hemolytic processes run fairly parallel, the iodin content of fat being a measure of the hemolytic power of the unsaturated fatty acids. The highest iodin values are found in pernicious anemia, hemolytic icterus and Hanot's cirrhosis.

Hemoglobin in blood serum and urine is of course unmistakable evidence of pathological blood destruction. It is of rare occurrence although there is reason to believe that in some instances it may be associated with morbid activity of the spleen. Increased bilirubin content of the serum, on the other hand, is frequently observed, and anemia, icterus and enlargement of the spleen are valuable clinical signs of pathological blood destruction.

Many authors, among them Kölliker, Gabbi, Heinz, Hunter, Banti, Minkowski, Chauffard and Eppinger, would assign an active rôle to the spleen in hemolysis; others like Ponfick, Paton, Goodall, Achard would have it play a passive part. The enlarged spleen would be to the first group an evidence of actively increased function; to the second a spodogenous tumor swollen by the products of destruction brought to it in the circulation. The experimental and clinical evidence emphasizing the importance of the spleen in hemolysis was admirably summed up in a communication by Banti to the last International Congress in London. He cited the work of *William Hunter* who first showed that removal of the spleen modifies or abolishes the hemolytic action of certain chemical agents like toluylenediamine; of *Bottazi* who found increased resistance of erythrocytes after splenectomy; of *Pugliese* and of *Gauckler* who demonstrated in animals that the secretion of bile was reduced 50 to 60% after splenectomy. From his own extensive clinical and experimental experience

Banti concludes that "the spleen is the organ in which hemolytic processes are most active. The other organs enter into action, especially when the dose of the hemolytic agents is higher, but their activity is always inferior to that of the spleen. Clinical facts have shown us in no doubtful manner that the spleen exercises so important a function in hemolytic processes that its extirpation is followed by rapid recovery from maladies which owe their origin to pathological hyperhemolysis. The experimental and histopathological results have fully confirmed this function, and therefore it appears that no reasonable doubts can be raised as to its existence. . . . From what has been said it follows that the spleen (as for that matter, the other organs also) has not an autochthonous and primitive hemolytic function; it responds in a secondary manner to the agents which have been carried to it by the blood. It is simply an instrument which is stimulated to hemolytic action by agents which do not reside within it. . . . Splenectomy does not, therefore, eradicate the disease—that is, the agents of the disease, whose nature and seat remain entirely unknown to us—but eradicates rather the principal instrument, by means of which these agents become pathogenic. These agents, whether on account of their nature, or because of their small amount, or for other reasons at present unknown, are not capable of exciting in the secondary hemolytic organs a pathologic hyperhemolysis, and the extirpation of the spleen is clinically equivalent to the cure of the disease."

Since Bottazi in 1894 found that extirpation of the spleen was followed by increased resistance of erythrocytes to sodium chloride solutions and to certain chemical hemolysins, the observation has been confirmed by workers in many different fields. The increased resistance may be demonstrated from the ninth to the twenty-seventh day after operation and may persist indefinitely (over a year, Pearce and Peet), (eight years, Banti). It does not depend upon the numbers of young cells in the circulation (Pearce and Peet), nor is it related to an increase of stroma constituents as determined experimentally in phenylhydrazine anemia by Morawitz and Pratt. According to Port certain hemolytic poisons like saponin act directly on the bone marrow so injuring it that corpuscles of decreased resistance enter the blood stream. Poisons of another class, like benzol, attack the circulating erythrocytes and the degeneration products stimulate the marrow to greater effort and to the elaboration of more resistant cells. Port would attribute the lessened fragility to an increase of the total lipoid and nuclear phosphorus. *Pearce* and *Karsner* conclude that "The erythrocytes of splenectomized dogs show increased resistance to the action of hypotonic salt solutions and to specific hemolytic immune serum. The degree of resistance appears to increase with the length of time that has elapsed after splenectomy. This increased resistance of the erythrocytes is not due to an increased antihemolytic power of the animal's serum or to a diminished complementary value of the serum, but is a property depending upon the erythrocytes themselves . . . as anemia of varying grade is a characteristic result of splenectomy, it would appear that the increased resistance of the corpuscles is a concomitant of the regeneration of the red cells following such anemia." In man, however, it has definitely been proved that the increased resistance does not depend upon anemia alone.

Since first described by *Chauffard* increased fragility of the erythrocytes has been recognized as a fairly constant sign in hemolytic icterus, although it may vary at different times in the same case or in different members of the same family afflicted with the disease. It is usually favorably influenced or totally disappears after splenectomy, although *Kahn* has reported its persistance after operation in a case of congenital hemolytic icterus. Decreased osmotic resistance may occur in hemachromatosis and rarely in pernicious anemia; all my recent cases of this last disease corresponded with the rule of normal or increased resistance.

Slowly, in light of experimental and clinical evidence, a classification is being attempted in the confusing group of splenomegalies. We may separate first of all a class of cases in which jaundice and enlargement of the spleen are more or less striking features. During last summer and fall through the courtesy of Dr. Hans Eppinger and Dr. A. von Decastello of Vienna it was my privilege to see a number of cases of hemolytic splenomegaly and of pernicious anemia, and to study sections of the spleens removed at operation. A number of others—among them hypertrophic cirrhosis, hemachromatosis, splenic vein thrombosis, Banti's disease and pernicious anemia were observed in my clinic during the last six months.

I. *Chronic Family Jaundice.* (Congenital Hemolytic Icterus) may be taken as a type of the hemolytic splenomegalies. The disease is most often hereditary or familial but there are acquired forms as well. There are families in which various members through several generations have from time to time symptoms which the older writers grouped under the familiar head of "biliousness." Occasional gastro-intestinal upsets with mild nervous symptoms are associated with a muddy complexion or slight icteric staining of the skin or conjunctiva. Through life there may be no accentuation of these symptoms and no swelling of the spleen. *Gilbert* and his pupils have used the term simple family cholemia to describe these cases, and have shown in them that the bile content of the serum is slightly above normal. The resistance of the red corpuscles may or may not be decreased, the hemolysis as marked by the icterus and urobilinuria is of the mildest. These cases represent probably the slightest departure from normal in the direction toward the well defined entity

hemolytic icterus. Two varieties of this disease are sufficiently divergent to be described separately:

1. Congenital Hemolytic Icterus. Though first mentioned by Murchison and described by Hayem it remained for Minkowski in 1900 to bring the disease prominently before the profession. The icterus which characterizes the affection is slight or moderate and may be present from birth or may not appear until the tenth or fifteenth year or even later. There are rare cases in which it may even be absent—the complex being recognized in these cases by the large spleen, increased corpuscular fragility and the familial association; thus *Lommel* records the case of a woman with hemolytic icterus who had two children with splenomegaly but no other symptoms. The jaundice varies frequently and may deepen after a diet error, or emotion or an intercurrent infection, although in this form deep jaundice and fever are much rarer than in the acquired. Bile is found in the serum but only exceptionally in the urine, whereas marked urobilinuria is a fairly constant occurrence. Moller found, quantitatively, that urobilin in both urine and feces was greatly increased, and the extensive investigations of Eppinger and Charnas have been mentioned above. Eppinger has found three or four grams of urobilin excreted daily in the stools instead of the normal amount, .15 gram. With this tremendous hemolysis there is little anemia as the bone marrow keeps pace with the blood destruction, there may be crises of blood degeneration but the anemia is rarely as profound as in the acquired form. Usually the count will remain in the neighborhood of 3,000,000 or 3,500,000 and as Chauffard has said, the patients are icteric but, as a rule, not sick or anemic. The characteristic feature of the blood examination is the increased fragility of the erythrocytes, first described by Chauffard. This decreased resistance may hold for various hemolytic agents but is usually tested by freeing the corpuscles from the plasma and placing them in sodium chloride solutions of varying strength. Normally hemolysis begins at .44 to .48 and is complete at .28 to .32; in hemolytic icterus it may begin at .6 or .7 and may be complete at .5. Microcytosis and anisocytosis are features of the blood smear, normoblasts are common. A relatively high polynuclear count and occasional myelocytes with great numbers of reticulated red cells, and erythrocytes with basophilic granulations mark the great degree of medullary activity. The great destruction of red cells leads to increased production of bile, to bile thrombi in the liver and so to jaundice. As we have already seen, this destruction of erythrocytes does not take place in the blood stream but to the greatest extent in the spleen: the splenic tumor is partly spodogenous but probably in chief part an expression of greater hyperemia and functional activity. The spleen is very rarely normal in size, usually it reaches to the umbilicus or fills the left side of the abdomen: weights of 900 to 3000 grams have been recorded. I have notes of two Italian families with hemolytic icterus; in one the mother and children of three and five were affected, in the other the mother and children of six, nine, and thirteen. There are some 150 cases to be found in literature. Minkowski and later Chauffard first suggested that an affection of the spleen was the chief factor in the congenital form of hemolytic icterus and the entire disappearance of symptoms and signs after splenectomy has brought clinical proof of the theory. The pathological findings at autopsy have been the same in hereditary and acquired forms. There have been few changes in the liver except great increase in pigment and frequent occurrence of gall-stones; siderosis is marked in the kidneys as in the liver, the bone marrow is red and shows signs of marked activity, the spleens at autopsy or operation are enormously hyperemic, most of the blood being in the pulp and not in the sinuses; pigment granules are much increased.

2. The acquired form of hemolytic icterus presents, as a rule, a decidedly graver clinical picture than the congenital. Anemia is often much more marked and predominates over icterus. The disease may begin abruptly with jaundice; fever is not uncommon, may be high and accompanied by delirium or stupor. The whole course of the disease is much more variable than in the congenital variety. It may extend over many years with remissions and exacerbations or may prove fatal in one, two or three years. The spleen is usually not so large as in the hereditary variety; hyperhemolysis, however, is sometimes even more in evidence, and the same high values for urobilin are found in urine and stool (Eppinger). The anemia may be extreme and may simulate pernicious anemia. These atypical cases of acquired hemolytic icterus are particularly worthy of note as mistakes in diagnosis may occur in several directions. Icterus may be absent or very slight and a diagnosis of Banti's disease is made. *Lommel* has emphasized this difficulty in diagnosis especially in cases of hemolytic icterus with normal erythrocyte resistance, and one of Tileston's cases had been labeled Banti's disease by a most competent clinician.

The number of cases with profound anemia has increased rapidly in the last two or three years. Many different names have been employed particularly in the reports by French and Italian authors but it seems wise in the light of our present knowledge, not to subdivide too minutely. Thus the *splénomégalie hémolytique* of Banti means nothing more than the sporadic form of hemolytic icterus which we have been considering, and his *splénomégalie hémolytique anhémopoiétique* indicates simply an exhaustion on the part of the bone-marrow with leukopenia. Dependent upon the degree of hemolysis and the varying reactions of the marrow there will naturally result many different clinical combinations. *Chauffard* and *Troisier* have reported under the

name of "*Ictère Hémolysinique*" a case of hemolytic icterus without fragility of the red cells but with hemolysins in the serum, and in this connection Guillain and Troisier have published very interesting observations upon the rôle of hemolysins in the local production of decreased erythrocytic resistance and of local hemolytic jaundice, as in hemothorax.

Even with red counts approximating 1,000,000 the decreased osmotic resistance and the characteristics of the stained specimens will usually distinguish from pernicious anemia, although confusing transitional cases have been recorded. Thus G. Klemperer has described a case with 1,500,000 erythrocytes, 1500 leucocytes, a color index of one and numerous megalocytes and megaloblasts with normal resistance of the red cells. Stejskal and Chauffard have both recorded cases with blood counts below 1,000,000 and Chauffard has described the occurrence of a hyperchromatic megalocytic type of blood cells. Parkes Weber has reported a case of acquired chronic acholuric jaundice with a blood picture at one time resembling that of pernicious anemia. Banti, J. Chalier, Chauffard and Troisier, Gilbert, Chabrol and Bénard, Antonelli, Micheli, Fiori have instructive papers on the association of splenomegaly with icterus and grave anemia. *Giffen* in his communication "Clinical Observations on Splenectomy" from the Mayo Clinic, mentions a case of atypical anemia which he considers as possible pernicious anemia. At operation two and a half years before, the spleen removed weighed 1540 gms. Hemoglobin at that time was 45% with high color index, and a few normoblasts and megaloblasts were present in the smears, and after splenectomy a shower of normoblasts and megaloblasts appeared in the blood stream. The man is still living but is anemic, weak and unable to work. Osler in his second report on splenic anemia changed the diagnosis in one previously observed case from Banti's disease to pernicious anemia. There can be no question, therefore, that some forms of acquired hemolytic icterus and some cases of pernicious anemia have much in common and differential diagnosis may be difficult. An intermittent course with occasional fever, slight icteric tint with bile in the serum, and large amounts of urobilin in the urine and feces, grave anemia, may be features common to both affections. Usually the increased fragility of erythrocytes in hemolytic icterus is not found in pernicious anemia. There are cases of pernicious, anemia, however, with slightly decreased resistance of the red cells and there are cases of hemolytic jaundice with normal resistance. Deep jaundice may occur in acquired hemolytic icterus, though rarely; it does not occur in pernicious anemia. The megalocytic hyperchromatic type of blood is the most constant criterion of pernicious anemia; in rare instances it may occur in hemolytic icterus. The spleen is, as a rule, greatly enlarged in acquired hemolytic icterus though not to the extent found in congenital cases. Splenomegaly in pernicious anemia is extremely rare but moderate enlargement is probably more common than clinical reports would indicate. Cabot records enlargement in 13 of 110 cases, Billings in 5 of 20 cases, McCrae in 6 of 40 from the Johns Hopkins material. In the last 10 cases personally observed the spleen was plainly palpable 2 to 10 centimeters below the rib border in 7. How difficult it is to classify some of the transition cases may be seen by the report of von Decastello at the last German Congress for Internal Medicine. In a man of 52 with rather sudden onset of the disease with fever there was icterus, a splenic tumor, achylia and a blood count as low at one time as 800,000 with leukopenia, a high color index and megalocytosis. The resistance of the erythrocytes was, however, decreased and splenectomy was followed by disappearance of the jaundice and great improvement in the general condition and the blood picture.

That the diagnosis is not always easy in other directions as well, is illustrated by the following case of mine seen some years ago by a well-known Eastern consultant who held positively to his diagnosis of malignant endocarditis. It was before many reports of the favorable influence of splenectomy had appearad and the original diagnosis of hemolytic icterus was confirmed at autopsy. A very stout man, weighing nearly 300 pounds was taken acutely sick during a journey back from Mexico, just after he had run for a train, became much overheated and drank freely of cold lemonade. After high temperature for a week his color was noted to be decidedly yellow, and he continued to be weak and to be bothered with shifting muscular and rheumatic pains. When seen in May, 1910, eleven months after the onset of symptoms, he had a large heart with hemic murmurs, a moderately enlarged liver and a spleen 10 cm. below the rib margin. Icterus was but slightly marked but urobilinuria was constant and pronounced. The Wassermann was negative. The red cells were from 3,000,000 to 3,500,000, hemoglobin 50 to 55%, leucocytes 4500 to 5000. During exacerbations in July, 1910, with temperature varying from 101° to 103° there was outspoken macrocytosis; during a later remission the size of the red cells became nearly normal and a few normoblasts appeared. Death took place 18 months from the onset of the disease during an exacerbation of fever. At autopsy there was no disease of the heart, the liver weighed 2000 grams, was not cirrhotic but contained much iron-bearing pigment. The spleen weighed 1550 grams and was tremendously hyperemic; microscopically the follicles were normal, the pulp hyperemic and granular pigment was seen in large amounts both in and between the cells of the pulp.

There can be no question of the value of splenectomy in this group of hemolytic anemias. In the congenital form of hemolytic icterus, owing

to the benign course of the disease the operation will not often be indicated. *Kahn*, however, has recently reported two cases much benefited by splenectomy, icterus disappeared and the corpuscular resistance rose considerably although it did not reach normal. Banti in 1893 first had the operation performed though the case was not classified as acquired hemolytic icterus or splenomegalic icterus until much later. Later communications of Banti, Antonelli, Fiori, Micheli, Exner, Mühsam, Eppinger and Ranzi, Chauffard and Troisier, Gilbert, Chabrol and Bénard give account of over 50 cases in which splenectomy has been performed. The general condition of the patients usually improves rapidly, hyperhemolysis ceases—as evidenced by disappearance of the excessive amounts of urobilin in urine and stool—icterus fades quickly, the resistance of the red cells approaches or becomes normal, and anemia is almost at once favorably influenced. Eppinger and Ranzi conclude: "Auf Grund unserer Resultate müssen wir bei typischem erworbenem hemolytischen Ikterus die Splenektomie für unbedingt indiziert halten; das Hauptkriterium erscheint uns nicht der Milztumor oder der Ikterus, sondern ausschliesslich der enorme Urobilinwert im Stuhl." The clinical results of splenectomy outweigh any theoretical considerations and it is impossible to deny the rôle of the spleen in the hemolysis that lies at the foundation of the disease.

3. Pernicious Anemia. Borderline clinical cases have been sufficiently discussed above. Eppinger has dwelt upon the similarity of the pathological changes in the spleen and other organs in hemolytic icterus and pernicious anemia, and has emphasized the identity of many of the clinical symptoms. In March, 1913, influenced by an unsual experience with splenectomy in varied effections, he caused the spleen to be removed in a case of pernicious anemia. In the same month and without knowledge of Eppinger's work von Decastello, another Vienna clinician, referred a case for operation on account of the success obtained by Antonelli, Banti and Micheli, in cases of hemolytic icterus with a blood picture resembling pernicious anemia. In a recent paper before the Association of American Physicians I was able to collect 33 cases of splenectomy in pernicious anemia and in discussion Dr. Thayer of Baltimore added two and Dr. Miller of Chicago one, a total of 36. Of the 36 cases eight died immediately or not long after the operation. There can be no question that in a number of instances rapid improvement followed the surgical procedure. A few patients have regained strength so rapidly—long before the blood count has risen much—as to confirm the opinion of Banti that poisons from the spleen act at times hyposthenically. Von Decastello and Dr. Judell have noted improvement in appetite and disappearance of stomach symptoms; the achylia persisting in von Decastello's cases. In nearly all instances reported the pathological hyperhemolysis was controlled by splenectomy. The icteric coloring if present, disappeared, the liver became smaller, urobilinuria ceased in a few days or a few weeks and urobilinogen in the stools was no longer excessive. In the case of Huber, however, urobilinogen was still present in large amounts in the stools three months after operation and in a case of Eppinger urobilinuria persisted and urobilinogen in the feces was still above normal. My patient noted the complete disappearance of the characteristic paresthesiae that had been so bothersome before operation. In the patients of Dr. Thayer and Dr. Miller spinal symptoms were unchanged. Chief interest centers in the remarkable changes in the blood picture almost immediately after operation. The characteristic feature is the appearance of great numbers of normoblasts, reticulated erythrocytes and erythrocytes with Howell-Jolly bodies. At times there is a quick rise in the number of erythrocytes, a million within a week, and there may be rapid improvement in the differential blood picture but the characteristic megalocytic type of blood may be found months after operation when the patient feels quite well, or after initial improvement or even disappearance the megalocytic picture may be reëstablished.

The spleens removed at operation are above the normal weight, if we assume this to be 200 grams,—570 grams (Mosse), 432 (Port), 500, 350, 350, 286, 435 (v. Decastello), 390 (Moffitt). Occasionally the spleen may be small, hard and fibrous. Usually there is marked hyperemia of the pulp, the sinuses being comparatively thin and empty. I have studied sections from eight operated cases. The capsule and trabeculae are usually little changed. The follicles may be somewhat atrophied, or normal, or decidedly increased. Eppinger has laid great stress upon certain changes of the smaller arteries which he regards as constant and characteristic. These changes are well illustrated in a number of these preparations. The walls of the follicular arteries are thickened and the lumen often narrowed by hyalin masses: the pulp capillaries are also thickened. It is difficult to believe with Eppinger, however, that these vascular modifications can divert the normal blood flow from the pulp and Seidel capillaries to the sinuses, and turn it through the intrafollicular capillaries into the interstices of the pulp. Occasionally macrophagocytes seem definitely more numerous and erythrocytes and fragments of erythrocytes can be seen within them. Small foci of myeloid metaplasia are not uncommon. Pigment varies greatly,—in two cases there was practically none, in two there was a small amount and in four there were great quantities of coarse brownish granules in and between the cells of follicles and pulp. The hyperemia of the pulp and the thickened arteries seem to be the most constant histological findings, but even these vary considerably. There is certainly no morphological indication of a greatly increased

phagocytic function in any of the preparations.

It is difficult to define the results of splenectomy in pernicious anemia with our present evidence. In certain cases no benefit has been obtained, in others striking improvement has resulted and cases are reported as apparently cured after periods of three or nine months (Mosse, Eppinger); in still others great betterment in symptoms and blood picture has been followed after weeks or months by a relapse. The varying degrees of reaction to the operation must depend upon the condition of other organs, particularly liver, bone-marrow and lymph glands. A number of writers, particularly Weigert, Warthin and Dock and Eppinger, have emphasized the increased activity of the hemolymph glands, and Eppinger is inclined to refer relapses after splenectomy to their increased hemolytic function. He suggests the administration of arsenic to check their development and counsels early operation in pernicious anemia before other hemolytic organs than the spleen have been involved.

Though since the early work of William Hunter we admit the great importance of the hemolytic function of the spleen in pernicious anemia, I think we must, with Warthin, realize that the infective agent or toxin of pernicious anemia "may act differently at different times or that there may be several hemolytic poisons and that there may be splenic, lymphatic, hemolymphatic or marrow hemolysis." The shifting clinical pictures, the various reactions at different times to remedial measures like arsenic, blood transfusion, thorium-x, salvarsan, splenectomy—the marked hemolysis in some cases (urobilinuria, icterus) and its absence in others, the inconstancy of marrow reactions—all speak for a widespread influence of the poison in the economy with maximum effects apparent now in this organ, now in the other. Perhaps, as Banti and Warthin first suggested, and as Eppinger now affirms, there may be some cases of pernicious anemia in which the hemolytic activity of the spleen overshadows other lesions, and perhaps in these splenectomy may, as in other hemolytic anemias, lead to permanent improvement, or even cure. But the proof of this theory is still inconclusive despite the benefit reported from operation, and it is difficult to decide in just which cases of pernicious anemia the operation is indicated and justifiable. I would agree with Eppinger in considering the prognosis decidedly better in those cases with large amounts of urobilin in the stool and mild icterus, especially if the spleen was definitely enlarged. We have in the operation, as Klemperer and von Decastello point out, a means of bringing about a remission fairly certainly when other means have failed, but that medullary reactions may occur in desperate cases of pernicious anemia as well as in apparent total exhaustion of the marrow in the course of other diseases is a fact well known to all clinicians, which counsels moderation of the enthusiasm in regard to operative results. In a case seen recently with Dr. Jellinek of San Francisco the necrotic changes in mouth and tonsils of a young woman who had until two weeks before been perfectly well, suggested at once an acute leukemia. There was marked anemia without nucleated reds and a leucocyte count of 800 to 1000, and from 98 to100% of the leucocytes were lymphocytes. There was fever and profound exhaustion Blood cultures and Wassermann were negative. There was no enlargement of glands or spleen and the bones were not tender. The diagnosis lay between aleukemic leukemia and profound streptococcic infection,—though the mouth lesions were not those of streptococci infection. Unusual in my experience was the degree of hemolysis and the slight icteric coloring. The prognosis seemed absolutely bad and yet perhaps influenced by the therapy, x-ray and leucocytic extract,—there was a prompt medullary reaction with disappearance of leukopenia, and restoration to health and a normal blood picture in the course of a fortnight. It may be mentioned in this connection that in a case of pernicious anemia no longer reacting to arsenic, improvement in the blood picture followed injections of leucocytic extract.

There is difficulty at times, as we have seen above, in distinguishing between cases of hemolytic icterus in which jaundice is either absent or little marked and cases of so-called Banti's disease. It is hard to determine just which splenomegalies should be included under the heading of

4. Banti's Disease. Tuberculosis and syphilis of the spleen may last for years and give rise to splenomegaly, to anemia and to hemorrhages. In a woman seen some years ago chronic enlargement of the liver with anemia, leukopenia and a large splenic tumor seemed to demand the diagnosis of Banti's disease. Recurrent metrorrhagia, however, raised the suspicion of syphilis, which was confirmed by the Wassermann reaction and results of treatment. Tremendous splenomegaly, enlargement of the liver and anemia were seen in both father and son not long since on a basis of syphilis. Marchand has particularly emphasized the importance of these cases. The splenomegaly of Gaucher's disease can now occasionally be diagnosticated clinically thanks particularly to the work of American authors, although in the eighteen cases of Banti's disease recently reported by Giffen the spleens of three were found after operation to show the endothelial proliferation characteristic of Gaucher's disease. The splenomegaly of tuberculosis rarely lends itself to a positive diagnosis. A young man of 26 was recently under observation in the University of California Hospital. His grandfather died at fifty from stomach hemorrhages and a big spleen. Apart from jaundice for a month in 1906, the man was perfectly well until he noted an enlargement in the

left hypochondrium in July, 1911. In September, 1911, after an unusual strain and a long automobile trip there was a large stomach hemorrhage. In December, 1911, he contracted lues and hematemesis occurred after salvarsan intravenously, and further large gastric hemorrhages have occurred recently. An enlarged spleen was found in October, 1911, and the present condition of the abdomen is seen in the appended photograph. Early in 1913 he had so-called "pneumonia" for eight weeks and cough and hoarseness have persisted. There is a tubercular laryngitis and tubercle bacilli are present in the sputum. The Wassermann and luetin reactions are now negative, there are 4,584,000 erythrocytes, 4,800 leucocytes and 65% hemoglobin, the resistance of the red cells is normal, urobilin in the feces is not increased, the streptothrix skin test is negative. The splenic tumor is smooth, but there is no way of determining clinically whether the case is a pure Banti or one of tuberculosis of the spleen with gastric hemorrhages, such as has been described by Lereboullet.

Cases of splenomegaly with hemorrhages from stomach and bowel should always suggest splenic vein thrombosis. In some instances the thrombosis follows a pylephlebitis due to infection of the navel at birth (Türk), at other times the clinical picture described by Eppinger may help in diagnosis as in a case recently observed in a hospital. A druggist five years ago in Manila had chills and fever occurring irregularly over a period of five months. Plasmodia were never found and the fever did not yield to large and continued doses of quinine. Since that time he had never been well. Gastric and bowel hemorrhages had twice occurred, and in the last year ascites had developed, necessitating tapping occasionally. On examination, the splenic tumor was out of proportion to the liver changes, and on account of the history of chills and fever at the onset, a diagnosis of splenic vein thrombosis was made clinically. There was secondary anemia and leukopenia but no hyperhemolysis. Operation was refused and autopsy showed an old splenic vein thrombosis. A man seen some years ago presented almost exactly the same symptoms over a period of six years except there was no ascites. The illness started in a malaria-free region with chills and fever lasting some weeks, there had been numerous attacks of hematemesis. When seen the spleen was below the level of the umbilicus and the liver not much changed, and at operation there were tremendously enlarged veins, leaving the spleen in several places; they were thick walled and calcified, and death occurred after operation, from stomach hemorrhage. It is difficult to say whether the following case is one of splenic vein thrombosis or of Banti's disease. A girl of 19, with neither luetic nor tubercular history, was seen two years ago, just after a large stomach hemorrhage which had come on without apparent cause. Against gastric ulcer at the time was the presence of many minute bleeding points in the rectum. The blood picture was that of a secondary anemia with 10,000 leucocytes. The spleen was enlarged by percussion, but could not be felt. There was no fever. During the next year and a half stomach hemorrhages recurred and the bowel mucous membrane continued occasionally to bleed from small areas. The spleen enlarged slowly until it nearly reached the umbilicus, the liver was moderately enlarged with sharp thin edge. On account of failure to control hemorrhages splenectomy was done last December by Dr. Levison of San Francisco, death occurring some days later from stomach hemorrhages. The marked degree of cirrhosis of the liver found at autopsy speaks more for Banti than for splenic vein thrombosis, and the thrombosis of the vein shown in sections seems recent rather than old. I have seen three cases of enlarged spleens in young individuals with continuous bleeding from minute points in the rectal mucous membrane, and no other hemorrhages. These cases of primary splenic vein thrombosis with recurrent hemorrhages are certainly more serious from the surgical standpoint than those of apparent primary Banti disease, as abnormally dilated and changed veins are encountered at operation and the danger from post-operative stomach and bowel hemorrhages is greater. Apart from splenic vein thrombosis I have seen nine cases of Banti's disease, four with stomach or bowel hemorrhages and five without. In a man seen recently in the University of California Hospital there was an eosinophilia ranging from 10 to 25%, for which no explanation could be obtained clinically or at autopsy, and in my experience eosinophilia must occasionally be referred to disease of the spleen alone. Interesting in this patient, in view of the communication of A. G. Gibbons concerning the presence of streptothrical organisms in the spleen in six cases of splenomegaly, was the negative skin reaction to streptothrix cultures. This test is being used now in the hospital in all cases of splenomegaly as well as in atypical lung and bone disease, as undoubtedly streptothricosis is much more common clinically than has hitherto been suspected.

There can be no question from the many reports now recorded that splenectomy may lead to a permanent cure in Banti's disease. Excellent recent communications are those of Mühsam, Eppinger and Ranzi, and of W. J. Mayo, Wilson and Giffen from the Mayo clinic. I agree entirely with Giffen that it is impossible as yet to correlate clinical and pathological findings, as the same clinical picture may be caused by spleens presenting marked differences in the relative relations of follicles and fibrous stroma. There is much to favor the view of Eppinger that the "*Fibro adenie*" described by Banti as typical of the disease may represent an effort toward reaction and healing from several varied morbid processes. Banti is inclined to think

that, even without obvious evidence of blood destruction, the underlying condition may, after all, be one of slow hemolysis, but the blood changes and the failure of urobilinuria and of icterus would in my mind speak more for an inhibition of bone marrow rather than for any hyperhemolysis. My experience with splenectomy in Banti's disease has been unfortunate—five operations and five deaths. Doubtless, as in all branches of surgery, fatal results are less often reported than the favorable ones.

Just as there may be transitions between hemolytic icterus and Banti's disease so, when icterus becomes a prominent feature, there may be transitions from hemolytic icterus to hypertrophic or Hanot's cirrhosis.

5. Eppinger has reported a number of instances of splenomegaly with peculiar clinical symptoms and has proposed to characterize them by the uncompromising name of megalosplenic cirrhosis. An apparent catarrhal icterus opens the picture, though in later months and years jaundice is variable or decreases. Pain in the liver region, chills and temperature are frequent. Pruritus and urobilinuria are constant and pruritus is often a dominating symptom. Liver changes are entirely in the background, while enlargement of the spleen is steady and, after years, enormous. Splenectomy leads to disappearance of pruritus and icterus. These cases are no distant relatives of splenomegalies reported by Giffin occurring in the course of chronic gall-bladder disease. In a man observed over a period of years pruritus and urobilinuria with an eosinophilia from 6 to 15% were the prominent clinical features, mild icterus was present from time to time with attacks of upper abdominal pain, the spleen was only slightly enlarged and anemia was often marked with occasionally a megalocytic blood picture. Death occurred after operation for relief of pyloric stenosis due to a chronic gastric ulcer. There was no cirrhosis and gall-stones were not present.

6. Hanot's cirrhosis has lately been added to the group of hemolytic splenomegalies. Eppinger thinks the liver changes due to thrombosis and rupture of bile capillaries following hyperhemolysis and excessive bile formation; clinically the cases resemble both hemolytic icterus and hepatic cirrhosis. Even with marked jaundice, if hemolysis be excessive as evidenced by large amounts of urobilin in the stool, splenectomy has led to surprising improvement. Eppinger goes so far as to say that " in allen Fällen von 'hypertrophischer' Lebercirrhose, wo ein Milztumor besteht, mächtiger Ikterus seit Jahren das Krankheitsbild beherrscht, und wo speziell eine alkoholische Anamnese nicht unbedingt im Vordergrunde steht, die Splenektomie anzuempfehlen ist." In an old woman seen recently thrombosis of the right femoral vein occurred seven years ago. This was followed by abdominal pain and fever, during which the spleen enlarged. Practically ever since then pruritus has been the cause of untold misery, though only in the last two years has jaundice been deep and bilirubin present in the urine. There is great enlargement of the liver and spleen, deep icterus, large amounts of bile and urobilin in the stool and a number of enlarged veins over the lower abdomen. Evidently thrombosis of the femoral and iliac veins was followed by thrombosis of the splenic vein with subsequent splenic tumor and hemolytic icterus. This in time has slowly been superseded by the clinical picture of hypertrophic cirrhosis.

7. The pathogenesis of hemachromatosis is still under discussion. Recent work of *Sprunt* suggests the possibility of a local origin of the pigment through autolytic changes in the cells of the liver and other organs, the cell degeneration taking place first and pigment deposits and cirrhosis coming later. The preponderance of evidence, however, favors the hemolytic origin of the disease. Mosse in a recently reported case found bilirubin in the blood serum and a marked urobilinuria. He raises the question whether splenectomy would not be an indication in hemachromatosis, as in hypertrophic cirrhosis. The specimens shown here are from a case seen in the hospital too late to consider operative treatment. There was a marked anemia, a bluish slate-colored pigmentation of the face, chest and arms, and a peculiar greenish-brown color to the ascitic fluid; sugar was not present in the urine.

8. It is impossible more than to touch upon the interesting Aleukemic Myeloid Splenomegaly lately described by Hirschfeld. The enlarged spleen, with varying types of anemia may lead to confusion with Banti's disease on the one hand and more rarely, with pernicious anemia on the other. The diagnosis in some instances may only be possible by finding evidence of myeloid metaplasia from splenic puncture.

It is not possible to consider here other interesting splenomegalies—as the Leishman-Donovan infection or the Egyptian Splenomegaly recently re-described in a paper of Owen Richards of Cairo. In dealing with the group of so-called hemolytic splenomegalies we are well aware of the incomplete character of our present clinical and experimental evidence. There are still many unknown quantities in hemolysis, and although we are fairly persuaded the spleen plays an important rôle, we are as yet ignorant of just how it acts. The mutual relations of spleen and marrow and liver and lymph glands are still imperfectly understood. In the enthusiasm which the results of splenectomy in this group of diseases naturally arouses we must remember that in most instances we are but breaking one link in the chain of morbid processes. Hypersplenism may be compared to hyperthyroidism, and in splenic as in thyroid disease, the triumphs of surgery have come through dealing with effects rather than causes. We must not be deterred, therefore, by the brilliant successes of operation

from seeking for the *ultimate* causes of hyperhemolysis and splenomegaly; the triumphs of the future in this newly opened field, like those of the past, can only come from patient correlation of work in the experimental laboratory, in the post-mortem room and in the clinic.

Original Articles.

ERGOTHERAPY IN THE TREATMENT OF MENTAL DISORDERS.

BY EVA CHARLOTTE REID, M.D., SAN FRANCISCO.

FOR centuries the unfortunate victims of mental disease were segregated and cared for simply because society had to be protected from them, and this was accomplished at the least possible expense and trouble to the community. They were considered as beings apart from ordinary humanity,—witches, monsters, "possessed of the devil." Those who were not burned at the stake or put to death in some such manner were locked up in cells, chained to posts or floors, placed in stocks, straight-jackets, cribs or cages. The only attention they received was to be given sufficient nourishment to keep them alive. When Pinel, in 1745, struck from the inmates of the Salpêtriére the chains which had bound them for years, he instituted the era of the humane treatment of the mentally sick, and the civilized world began to realize that these unfortunate individuals were not necessarily dangerous to themselves or others. From that time the instruments of torture and restraint began to disappear from the asylums, and for another century the most advanced of these institutions considered they were doing their duty by their patients when they gave them humane, custodial care. It was not until the latter part of the last century that the subject of the treatment of mental disorders began to agitate the minds of the leading psychiatrists. It was very soon discovered that this long-neglected branch of therapeutics was worthy of investigation, and that much could be accomplished toward the cure and amelioration of mental disease. As a result, in up-to-date hospitals for the insane, patients are being treated by psychanalysis, mental suggestion, sero-, radio-, hydro-, and ergotherapy.

Ergotherapy, or the work treatment, although to many it seems the most rational and productive of any of the general agents employed in the treatment of cases of mental disorder, is still neglected to a deplorable extent in our present-day institutions. Considering the importance of work to the well-being of the normal mind as well as the body, its value in the treatment of the abnormal mind can readily be surmised. "Employment," said Galen, "is Nature's physician." In every place and under every circumstance, we see idleness conducive to unhappiness, mental, moral, and physical deterioration. The fact that employment can distract the mind from physical disorders, and stimulate the functions of the body, is being recognized and utilized by the medical profession in general. The phenomenal success of a sanatorium in California for the treatment of tuberculosis in wage-earning women is no doubt partially due to the fact that they are engaged in an occupation which diverts their minds and defrays their expenses. Idly contemplating a long illness entailing great expense and enforced idleness for months, and perhaps years, would be sufficient, in the case of the average young person who is accustomed to work, to produce a mental depression which would almost prohibit recovery. Paranoia was once described as an "inability to forget." The average hospital for the insane gives its patients no chance to forget the past, and makes no attempt to substitute new interests for those left behind in the home, society or place of business. If forgetfulness of real or imaginary wrongs was difficult in the old environment, it is impossible in the new.

Although the patients in hospitals for the insane have for many years been encouraged, and in many cases forced to work, it was purely a question of economics, and not therapeutics. It is only within recent years that any attempt has been made in this country to utilize, in a systematic and scientific manner, occupation as a therapeutic measure. At the present time only sixty per cent. of the state hospitals in America are making such an attempt.

Last year, the American Medico-Psychological Association appointed a committee on diversional occupation of the insane, which reported, "Diversional occupation, scientifically and systematically applied, marks the standing of a hospital, and if neglected or omitted, the patients are not receiving the most modern care and treatment to which they are entitled."

Work may be made a great detriment or a valuable therapeutic agent in the treatment of mental disorders, according to whether or not it is scientifically applied. In institutions where much of the hard labor is done by patients, and a certain amount *must* be accomplished, the tendency is to make drudges out of the willing and efficient workers, and to allow to remain in complete idleness those who require to be instructed, supervised and handled with tact. Let us consider the fate of a female patient suffering from dementia precox, and committted to the average state hospital, where little or no attention is paid by the physician in charge to the occupation of the patients. Shortly after the case is diagnosed, she is sent to a chronic ward. If she shows an inclination to work, she is given a trial in the laundry, sewing or dining rooms of the

institution. If she proves careless or inefficient in her work, she is sent back to the ward. Because she allowed an "iron to burn out," spoiled a garment in the making, or broke a few dishes, many a poor soul has been condemned to perpetual idleness for the remainder of her life. Returned to a chronic ward, without any occupation or diversion, her life naturally falls into a dull and monotonous routine, unless she creates some diversion by assaulting those around her, tearing her clothes or destroying furniture. The notes on such a case show that each year she becomes a little more untidy, a little more indifferent, a little more demented, until she is completely "hospitalized," and as a result we see the finished product,—the untidy, indifferent, destructive, violent precox found in large numbers in every hospital for the insane, and constituting its greatest problem.

On the other hand, if a patient prove to be a willing and efficient worker, she is condemned to a life of hard labor. In every state institution we find old demented patients whose life has become an existence of hopeless drudgery, with no time allowed them for recreation or diversion. This system of overworking patients has resulted in physical deterioration in many cases, and tuberculosis has been contracted. These patients being too demented to realize their failing strength, have gone on working in poorly ventilated workrooms until their condition became hopeless. Illustrative of this fact, was the case of an old woman recently under care in a state hospital. Seeing she was failing physically, she was given parole of the grounds, and urged to spend part of the day sitting in the open air. At first she replied, "No, no, I have not wasted a minute in ten years, and I can't take the time to sit idly on the parole ground." Equally pathetic, and illustrative of the harm done by overworking patients was a case who was transferred from another state institution. For months after her admission to that hospital, she worked in a poorly ventilated basement room, stitching overalls. She developed a cough, and felt that her strength was failing. Permission to discontinue her work was denied, as the institution was short of workers, so she decided to escape. The attempt was unsuccessful; she was brought back and placed in restraint, where she remained until transferred to my service. On admission, she was defiant and suspicious. When she found that she was not going to be compelled to work, she gradually changed her attitude, and at the present time has parole of the grounds, which she never abuses, spends part of her time doing fancy work, and is happy and contented.

The benefit to be derived from the scientific application of ergotherapy will result in threefold advantage,—to the patient, the institution and the state. The busy patient is happier, more contented and deteriorates less rapidly than the idle one. If all the patients were employed, an institution would require fewer attendants, there would be less destruction of clothing and furniture, and the hospital, and consequently the state, would reap the benefit. In every hospital for the insane, public and private, there is a vast amount of energy going to waste that might be utilized to make the institution largely, if not completely, self-supporting.

In order to make ergotherapy effective in the treatment of mental disorders, there are three factors which are absolutely essential: first, physicians who are trained psychiatrists; second, vocational instructors; and third, nurses trained in the care of mental cases. Our concern is with the second essential.

Every hospital for the treatment of mental cases should have one or more vocational instructors, whose duty it should be to consult with the physician in regard to the employment of individual cases, distribute the work to the various wards, instruct the nurses in the oversight of the patients, conduct classes in the various occupations, attend to the purchase of materials and the sale of articles manufactured.

In order that patients who cannot receive instruction in classes should receive individual instruction, it is necessary to have nurses in charge of each ward trained in the care of mental cases and able to do some vocational work. Large hospitals for the insane all over the United States are establishing training schools for nurses, but very few of them include in their curriculum a course on the occupation and diversion of patients. In the Sheppard and Enoch Pratt Hospital, Maryland, such a course was established in 1912. This includes instruction in playing games, string work, paper folding, book-binding, basketry, embroidery, leather, wood and metal work. Each nurse, in addition to taking the course, is required to spend one month as assistant to the vocational instructor. In small hospitals, however, it is impossible to organize training schools, and for that reason every state should have a training school for mental nursing, and only graduates from these or similar schools should be employed as charge nurses in state hospitals.

Having secured physicians who are experienced psychiatrists, vocational instructors and nurses trained in the care of mental cases, it is possible to teach every patient, aside from senile and paretic cases, some useful occupation which will make them partially or wholly self-supporting, and prevent habit deterioration. Pursuant to this idea, the writer has personally supervised the occupation of every new patient received on the female service of a state hospital for the past year. With the exception of two senile cases, and two cases of general paresis, every one of the sixty cases received has shown that she is capable of being taught to do some kind of work. Under the proper conditions, there is no reason why these patients should not continue to work so long as they are in the hospital.

In order to accomplish the best results with ergotherapy, it is necessary to commence early. As soon as the patient becomes accustomed to the new environment, and the initial excitement has subsided, work should be insisted upon. Each individual case is a study in itself, and it is often necessary to change a patient many times before a suitable employment can be found. Individual tastes must be consulted. One of my patients refused to do anything but plain hand-sewing. She stated that the currents from the electric sewing machines affected her head, and all forms of fancy work she considered unmitigated foolishness. Another refused to do anything so prosaic as plain sewing, but loved to weave baskets, in which she intermingled in a wonderful manner colors of the most brilliant hue.

A new occupation is the most beneficial in convalescent cases and depressions, where there is a tendency to introspection and retrospection. The mental effort of learning to do something new distracts the mind and stimulates the faculties. On the other hand, dementing or demented cases often refuse to make the mental effort necessary to acquire even new motor reactions, and if disturbed in the routine they have followed for years, they refuse to do anything.

It is likewise important that patients be put to work on something obviously useful. No permanent improvement results from teaching patients to piece together picture puzzles, solve maze puzzles, place pegs in a board or fold paper. Even the most demented can see the futility of such proceedings, and soon tire of them. In the majority of cases, patients retain their interest in an occupation better when they receive some reward for their labor. This can be arranged by providing extras in food, clothing, more liberty, for those who work in sewing rooms, laundry and dining rooms, and by apportioning to each individual patient a certain percentage of the proceeds from the sale of work. This sum they can spend in any way their fancy dictates. Regarding the kind of work that can be done by patients in a hospital for the insane, there is no ordinary work that can *not* be done by them, if the work is adapted to the individual cases and they are properly instructed and supervised.

There are a few general rules which might be laid down in the application of the different kinds of work to different classes of cases. The only cases to which ergotherapy may be applied indiscriminately are the chronic alcoholic and drug habitués, which the already overcrowded state hospitals of California have had thrust upon them. A careful observation of these cases, and testing by the Binet scale, has shown that they belong largely to the moron type, and have an average mentality of a child about ten years of age. They are sufficiently high-grade to escape commitment to a home for the feeble-minded, not sufficiently vicious to be sent to a prison or penitentiary, yet not sufficiently high-grade to avoid getting into trouble. These patients, coming as they do from the middle and lower classes of society, have been accustomed to hard work, and having no resources for entertaining themselves, welcome work as a relief from the monotony of institutional life.

The work of the epilepties must necessarily be circumscribed and spasmodic. Nevertheless, they should be urged to employ themselves constantly at something. They should be encouraged, as a rule, to stick to one kind of work. After a time, its performance becomes mechanical, and as dementia proceeds, the motor reaction takes place without the expenditure of any mental effort. I have frequently seen epileptic women so demented that they could scarcely tell their own names, who could crochet or embroider with unusual skill.

The treatment of the manic-depressive psychosis by ergotherapy is a problem which demands long experience, careful study and observation of individual cases. If the hypomania which so often precedes an attack of mania were diagnosed and treated by the general practitioner by the removal of the mental stress and strain incident to school or college work, business, professional or society life, and a complete change and rest ordered, many a case of manic-depressive insanity would be spared the inconvenience and humiliation of being committed to a hospital for the insane. By the time such cases are received at the hospital, the excitement is usually well developed, and the apparent superabundant energy of the patient is being wasted prodigally in purposeless, if not harmful, activity. To attempt to limit this activity by physical restraint is worse than useless, but to direct it into useful channels is a task which calls for the greatest skill, patience and tact. The more like play the work can be made the better, and it should be such as to call for no continued mental effort or exercise of patience on the part of the patient. It is often necessary to try first one kind of employment and then another. If the patient can be made to work only a few minutes on the first trial, the length of time can be gradually increased. These patients often have a dominating idea of reforming everyone and everything about them, and it is sometimes well to take advantage of this idea. I recall one manic-depressive who regularly, during her excitements, undertook the reformation and re-education of a case of dementia præcox on the same ward. She taught her to dress herself, comb her hair and help with the ward work. The excitement of others may take the form of a graphomania, and these patients can be encouraged to write letters for patients who cannot do it for themselves. I recall another manic-depressive case who took it upon herself to renew the interest of several neglectful relatives of patients on her ward. This

she did by writing lengthy epistles, appealing to them in various ways, and some of these letters accomplished their purpose.

During an oncoming depression of manic-depressive insanity, I believe work is, as a rule, harmful, and these patients should be relieved from the discharge of all duties, and if possible, be made to remain in bed. A manic-depressive formerly under my care told me that for years before her admission to a hospital she had warded off depressions by dropping all her household cares and social obligations when the first symptoms appeared, and going away for a rest. She likewise stated that even to dress herself seemed such a gigantic undertaking that she would lie awake and wonder how she could accomplish it. A patient who formerly had a depression every few months has been under my care for the past year, and has not had an attack during that time. As soon as I noticed the slightest change in her appearance or demeanor I made her discontinue all work, and ordered rest in bed and hydrotherapy. She herself is confident that at least two depressions have been warded off in this manner. When convalescence is established, interesting and absorbing occupation should be furnished.

Dementia precox, like manic-depressive insanity, often shows itself during a period of unusual mental or physical strain, with the difference, however, that as the excitement of a manic-depressive increases he becomes more and more zealous in his work, oversteps the limit of his authority and over estimates his strength and ability, while the precox gradually loses interest in his work, becomes indifferent, apathetic and often hypochondriacal. These patients, on admission to a hospital, usually give a long history of having drifted from one occupation to another, their failing efficiency being evidenced by a gradual decrease in salary.

In view of the fact that more than one-half of the permanent population of hospitals for the insane is composed of cases of dementia precox, it would seem that this class of cases offers the best field for operations in ergotherapy. The importance of preventing habit deterioration by early and systematic cultivation of the work habit is evident. Perhaps the first hospital in the United States to make any attempt to progress along this line was the Taunton State Hospital, Massachusetts. Dr. George C. S. Choate, the superintendent, in his Annual Report of 1854, gave it as his opinion that two-thirds of the patients in his hospital were capable of employment of some sort. Although the work there has been allowed to lapse somewhat from time to time, the report of that hospital for 1912 shows that seventy-four per cent. of the patients are working. In the New York state hospitals considerable work is being done in the re-education of advanced cases of dementia precox, with good results. At the Government Hospital for the Insane, Washington, D. C., a series of experiments were undertaken by Dr. Helen Grace Kent and Mr. E. G. Boring, to ascertain the extent to which this re-education could be carried. The principle conclusions drawn by Dr. Kent from several months' work were: "(1) Definite practice effects can be obtained by means of a short series of tests from advanced cases of dementia precox. (2) Practice effects are transferable from one kind of work to another, differing in perpetual but not in motor aspect. (3) Energy expended in mischievous performances may be directed into favorable channels." Mr. Boring's experiments, which included the teaching of rug making, showed similar results, with the additional conclusion that, "Patients suffering from dementia precox are capable in simple industrial operations of a quality of work sufficiently good to be of commercial value." These experiments, which consisted of arranging and cancelling digits, identifying geometrical figures, solving maze puzzles, etc., had the disadvantage, with the exception of the rug-making, of lacking appeal to the patient's esthetic or industrial sense. They could see nothing to be gained by such exercises, and consequently lost interest.

To re-educate the vast army of demented patients in our hospitals for the insane, would be a task which would involve an expenditure of time, energy and money which, in all probability, would not be warranted by the results obtained. The new cases of dementia precox can, however, with comparatively little trouble, be directed into better paths, to the end that the chronic wards in hospitals for the insane will be filled with patients who, although demented, will be quiet, tidy, industrious and contented.

THE USE OF A SECTION OF THE SCAPULA IN CORRECTING A NASAL DEFORMITY.

BY OLIVER A. LOTHROP, M.D., BOSTON,

Assistant Otologist, Massachusetts General Hospital; Clinical Assistant, Massachusetts Charitable Eye and Ear Infirmary; Assistant in Otology, Harvard Medical School.

THE various types of nasal deformity require entirely different operative procedures for their correction. The simplest type is that of the fracture-dislocation of the nasal bones, and the operation required in such cases consists in a re-fracture and then a reduction of the dislocation. A second type is exemplified in the lateral deviation of the cartilaginous portion of the nose. Another type may be noted in the aquiline deformity which requires a special technic for reduction.* The irregular humps often

* An Operation for Correcting the Aquiline Nasal Deformity, BOSTON MEDICAL AND SURGICAL JOURNAL, May 28, 1914, Vol. clxx. p. 835.

found at the distal extremity of the nasal bones are amenable to special surgical procedures.

Depressions of the nose bridge and destruction of the septal, supporting cartilage, so that the tip of the nose is depressed and unsupported, require the addition of material to fill in the depressions or support the tip. Trauma, syphilis, and abscess of the septum are the common causes for these destructive deformities. Deformed noses resulting from a combination of one or more of the above types present the most difficult cases in external nasal surgery with which the rhinologist has to contend. It is with the plastic surgery for correcting this complex type that this paper is concerned.

Paraffin injection, cartilage taken from the nasal septum, rib cartilage, and pieces of bone have been more or less successfully employed in filling in depressions of the nose bridge. Paraffin was one of the first substances used and was injected under the skin to fill in small depressions. It was often successful in these cases, but could not be used to fill in large depressions or to support or straighten the tip of a nose. Its distribution could not always be controlled and it was liable to travel, break down and become septic.

The cartilage obtained when doing a submucous resection of the nasal septum has no adherent perichondrium to nourish it and it is so very pliable that it is almost impossible to avoid contamination while withdrawing the section from the nose. In case of infection during its use, which is not infrequent, there is danger of having it slough away, and even in cases where it has been successfully grafted, occasionally, after some time, the cartilage has slowly absorbed.

Rib cartilage is more satisfactory. In the first place, it can be obtained sterile; second, a piece of any size and shape may be removed; and, third, perichondrium to nourish it can be left on one surface at least. On the other hand, it is not easy to remove a rib and there is always a chance of puncturing the pleura, with its attendant discomfort and possible danger. This cartilage, too, is pliable and can be used only where there is support at all points beneath it.

Bone is more vascular and can be more surely kept alive and nourished through its periosteum. It is rigid and, hence, does not need the support that is required for cartilage. On the other hand, it cannot be shaped easily and there are few places in the body where a satisfactory piece of bone covered with periosteum can be spared and at the same time be easy and safe to remove.

It was while giving these facts consideration that the writer decided to experiment with a strip of bone from the free vertebral border of the scapula. Here one may obtain a thin, rounded strip of vascular bone, straight for two inches or more, covered with periosteum on two surfaces and its free border. This needs no shaping other than to determine the length and width required. Other advantages which may be mentioned are the safety of operating in this region, the superficial and easy access to the scapular border, and the facility with which a strip of bone may be removed,—all tending to consume very little time.

The technic of obtaining and employing this scapula bone graft in correcting a deformed nose can be illustrated best by describing an actual case.

Photograph of patient before operation showing the deflection of the nasal bones to the patient's left and the cartilaginous portion and tip depressed and twisted to the right. The broken line accentuates the median line of the nose.

J. J. B., 21 years of age, was referred to me by Dr. Jelen for operation. Many years ago he was struck on the nose by a baseball bat, but otherwise, does not remember the cause of his deformity. There was no evidence of syphilis. As is shown in the accompanying photographs of the patient, the nasal bones were dislocated to his left and there was a prominence at their distal extremity. There was no support from the cartilaginous septum, so that the tip of the nose had fallen and deviated to his right. What was left of his cartilaginous septum was fractured, deviated, telescoped and cicatrized into a mass obstructing his breathing.

The operation was performed under ether anesthesia with patient in the recumbent position on the operating table. The vestibules and external nose and the face were rendered as sterile as possible. First, the septum was resected submucously in the usual way in order to remove all obstruction to breathing, and also to free the soft tissues of the tip which could then be raised and moved easily in all directions.

Then the patient was turned on his left chest and his back thoroughly sterilized. A 3½-inch skin incision was made over the vertebral border of the left scapula. The incision was then carried through the

Oblique view before operation showing prominence of nasal bones and sag and twist in the cartilaginous portion.

Front view after operation.

Side view before operation showing there was no support to the tip of the nose from the cartilaginous septum.

Side view after operation.

deep fascia down to the bone. The attachments of the muscles were cut from the border and from the external and internal surfaces, great care being taken not to denude the bone of its periosteal covering. One should be careful not to enter the bursal sac between the subscapularis muscle and the chest wall because this opens a space in which blood and serum may accumulate. A strip of bone, two inches long and about one-quarter of an inch wide was then removed from the free border with bone cutting forceps and wrapped in wet, sterile gauze. The fascia was sutured with interrupted, plain catgut sutures, and the skin approximated with interrupted silk-worm gut sutures.

The patient was returned to the dorsal position, the nose re-sterilized, and a quarter-inch incision made in the under surface of the tip of the nose, half way between the tip and the beginning of the columella. A subdermal passageway was made in the nose bridge extending to the distal extremity of the nasal bones. At this point the periosteum of the nasal bones was cut and elevated along the crest

of the nose bridge up to the frontal bone. The nasal bones were now ground down with a rasp, in order to remove the prominence and deviation to the left above referred to. The coarser bone filings were scooped out of the passageway with a curette and the graft which had been taken from the scapula was inserted through this passageway and under the periosteum until the end reached to the frontal bone. The incision in the tip of the nose was closed with two interrupted horsehair sutures and covered with a cocoon. Slight pressure was applied over the graft at its frontal end in order to hold it pressed against the nasal bones and to stretch the contracted soft tissues of the tip.

The patient made a good recovery and there was no infection about the nose. The nose was much swollen and this swelling subsided rapidly after the third day. The anticipated ecchymosis under the eyes lasted a few days. Removal of the horsehair sutures took place on the fifth day and the wound had healed by first intention. No discomfort had been experienced by patient from either his nose or his back and, after healing, he had full play of his scapula and the attached muscles.

For four weeks a narrow strip of crêpe lisse was stretched from the tip of the nose to the forehead, being made adherent to the skin at these points with collodion and exerting just enough tension to raise the tip. Counter pressure was made over the frontal end of the graft by placing a ball of cotton between this point and the strip of crêpe lisse.

In two weeks granulations had attached themselves to the periosteum of the graft, thus binding it to the nasal bones so that the graft was becoming firmly fixed. In three weeks the graft was quite solid and in four weeks it was very rigidly held in place on the nasal bones and the dressing was omitted. By this time the skin of the nose had resumed its normal color.

X-ray print. Lateral view, showing the scapula bone graft in position. The graft rests on and is adherent to the prepared surface of the nasal bones and one-third of its length projects forward and downward supporting the soft tissues of the tip. The end of the graft does not reach to the extreme tip of the nose by three-eighths of an inch, support there being unnecessary.
(X-ray obtained through the kindness of Dr. Walter Dodd.)

The advantages of an incision at the tip rather than the one usually made at some point on the bridge are that a long straight graft may be introduced without bending; it can be more accurately inserted under the periosteum of the nasal bones, and the scar is in an inconspicuous position, leaving no external signs of operation.

Clinical Department.

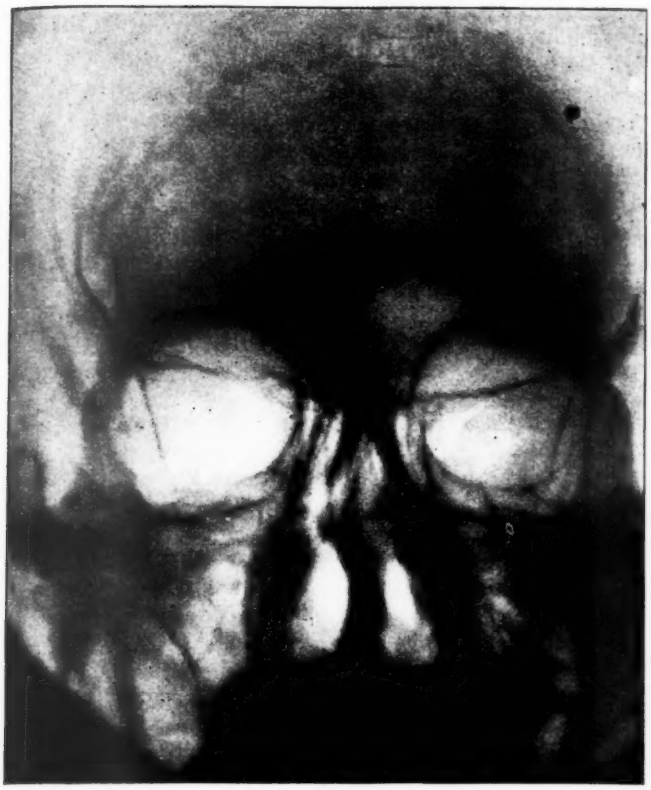
ANOTHER CASE OF SYPHILIS OF THE NOSE.

BY JOSEPH PRENN, M.D., BOSTON.

THAT syphilis is sometimes, though rarely, responsible for the condition of "atrophic" rhinitis with ozena is reported in literature. It is usually characterized by a copious discharge, mostly bi-lateral, sometimes uni-lateral, with or without crusting, with either marked or slight involvement of one or more of the sinuses: ethmoid labyrinth, sphenoid and frontal sinuses, and antrum of Highmore. Sometimes only a cloudiness of the mucous membrane of the sinuses can be demonstrated.

The text-books place syphilis alongside with tuberculosis as a possible etiological factor of this condition. Neither in the former nor in the latter, do we get characteristic lesions such as ulcerations or broken-down tubercles or gummata, respectively. It is reasonable to assume that the condition is brought about by the low resistance of the mucosa due to the disease. The blood is impoverished; and in the case of syphilis, it is also reasonable to assume that gradual changes take place in the walls of the blood vessels, as the disease is known to sclerose the same in other parts of the body. The cells, therefore, do not get the proper nutrition. The mucous membrane becomes eventually atrophied, its cells do not secrete sufficient mucous to lubricate and wash away injurious element that may gain access into the nasal chambers, and erectile tissue may shrink. The picture is that of anemia. The pyogenic bacteria invade the partially devitalized mucosa and form pus. The latter accumulates, especially in the tight places where drainage is deficient, opposite and around the middle turbinates and the openings of the different sinuses, and eventually the bacteria may extend into them. A vicious circle is then formed. When the vitality of the mucosa is very low, the bacillus ozenae, like the saprophytic bacteria, is attracted by the dying tissue, and by further decomposition, produce the nauseating odor.

Sometimes the nauseating odor alone, without the invasion of the pyogenic bacteria, and without any discharge in the nasal cavities or the sinuses, as proven by the x-ray, may be the only manifestation of the existing disease. One looks in vain to ascertain the source of the odor, until



he gets the idea of a possible existing syphilis. Much the same as the clinician would think of an unexplainable tumor, that it might be a gumma, and subject the patient to KI. as a therapeutic test. He takes the blood for a Wassermann and it is found to be positive.

As we have stated above, the diagnosis of syphilis of the nose in conditions of atrophic rhinitis, copious discharge around the middle turbinates, and ozena, cannot be made definitely by local lesions. We think of syphilis in these cases as a differential diagnosis, and it is only in a very small percentage of cases that it is actually the cause.

The case we are about to describe had certain findings by which a diagnosis of syphilis could be justified clinically.

Male, 32, married, shipper. No syphilitic history. Complained of nasal obstruction, hoarseness, frontal headache of long standing.

Examination. No external nasal deformity. Left nostril: hypertrophied inferior turbinate, anterior deviation, copious discharge covering the middle turbinate, and turbino septal space. No crusting. No ozena. Right nostril: high deviation of septum along the perpendicular plate of the ethmoid. On close observation, one could see that he is not dealing with a simple deviation only. There was an appreciable thickening on the convex side. The probe proved it to be hard, and not a soggy mucous membrane. No discharge. The pharynx showed signs of pharyngitis sicca with discharge coming down from the epi-pharynx. Larynx showed dry, reddened vocal cords with discharge between the arytenoids and along the posterior wall. Therefore, chronic laryngitis, with discharge dropping down from the naso-pharynx. The diagnosis of syphilis was made based upon the symptom complex with the special aid of the marked thickening of the septum, assuming it to be a gumma or a syphilitic periostitis. It had to be differentiated from a possible sarcoma. X-ray and the blood for Wassermann were taken before anything was done to the nose. The x-ray as is shown by the very interesting accompanying photograph, brought out very markedly the following points: marked right frontal sinusitis with slight ethmoid involvement, affection of antrum and ethmoids on the left side. The condition of the septum is beautifully illustrated. There is a dissolution of the continuity of the septum, an empty space on the side showing the loss of bone substance which is the gumma, with a marked wide convex shadow around it which may be a syphilitic periostitis. The fact that the x-ray shows a right frontal sinusitis is not necessarily in conflict with the clinical findings of the discharge in the left nostril. Discharge means drainage, plenty of discharge means plenty of drainage; hence, no empyema may be in back of it, while, when there is no discharge, it may mean obstruction of the infundibulum with an empyema behind it. This holds true everywhere, and in our case, we must also consider a gumma which is entirely independent of the discharge.

The Wassermann was triple positive.

Operation in such a case would be out of the question. The patient was put on an antisyphilitic treatment with salvarsan injection.

The writer wishes to express his thanks to the x-ray department of the Boston City Hospital for the loan of the plate, with permission to print.

Medical Progress.

REPORT ON DERMATOLOGY.

By John T. Bowen, M.D., Boston.

The Nevocarcinomata.—The Nature of Rodent Ulcer.—The Healing of Skin Cancer with Salicylic Acid.—Generalized Zoster, with Changes in the Cord.—The Treatment of Pruriginous Dermatoses with Normal Serum.—Tinea Imbricata.

THE NEVOCARCINOMATA.

Darier,[1] who reports the results of an extensive study of this class of cases, follows Unna in describing the nevocarcinomata as the malignant tumors that have their origin in the cellular nevi or soft warts. As these nevi are most often pigmented, the nevocarcinomata are also usually pigmented, at least in part, hence they have been called melanotic carcinomata, melano-sarcomata, melanomata, melanoblastomata, chromataphomata, etc. In this class belongs also the "malignant lentigo of old age," or infective melanotic freckle, which has been recently studied by Dubreuilh under the name of circumscribed precancerous melanosis. These are late, non-elevated nevi, identical anatomically

with the cellular nevi, and may be equally the point of origin of nevocarcinomata.

Much controversy, as is well known, has arisen as to the origin of these cellular nevi or soft warts. Considered, following Virchow, for a long time as of connective tissue origin, and the malignant tumors which often follow them as sarcomata, it remained for Unna to be the first to question this view. He showed that in all the nevi of the new-born, and of infants, a connection could be traced between the rows and clusters of cells, and the epidermis, and its appendages, and concluded that the nevi and nevocarcinomata were epithelial formations.

Basing his conclusions on histological studies of these neoplasms extending over twenty years, Darier believes firmly that thes nevi and nevicarcinomata are tumors of epithelial nature, and deserve to be included under the epitheliomata of the skin. His figures show clearly the connection in places between the epidermal structures on the one hand, and the cellular masses on the other hand. There is present in the epidermis a special cellular alteration and the altered elements are pushed both downward into the corium, and upward into the horny layer.

With regard to the pigment, his preparations give the distinct impression that it is formed in the epidermic cells, especially in those of the first row, and that its formation marks the début of the cell-alteration. It may be the only apparent lesion in certain of the cells, but it is by no means constant and may be totally lacking in some nevocarcinomata in full development. The view of Unna, Delbanco and others, according to which the pigment may be the exciter of the segregation and proliferation of the cells, is opposed by the fact that there is no relationship between its abundance and the evolution of the tumor.

These nevi may show themselves at birth or may appear at any age, even advanced age. In any case, they seem to be due to a local malformation of embryonic origin. A cellular or pigmented nevus may take on at any time malignant attributes, although it may be said, considering their extreme frequency that this transformation is exceptional. According to Darier, the symptoms that suggest and give warning of a malignant tendency are a relatively rapid growth, a congested border at the base and at the periphery and pricking sensations experienced by the patient. Ulceration, enlargement of the lymphatic glands, the appearance of metastasis or melanosis are, of course, conclusive. the secondary metastatic tumors differ in their point of origin, development and microscopical anatomy, from the initial tumor. In these secondary tumors no point of connection with the epidermis are found. They resemble the secondary nodules of a cancer of the breast, for exemple, and result from a cancerous lymphangitis.

With regard to the treatment of this class of cases, it is certainly irrational to counsel the destruction of all fixed cellular nevi and so-called soft warts with a view to escaping the possibility of their assuming a malignant character. If, however, for cosmetic or other reasons, this course is decided on Darier gives preference to carbon dioxide snow, electrolysis, etc., rather than to the knife. Less active caustics and radiotherapy are not favored, the former methods being dangerous, the latter method uncertain. With regard to the treatment of the progressive nevi, and the nevocarcinomata, he says that surgeons and physicians of surgical temperament do not hesitate to insist on radical excision, with a good margin of security, together with the suspicious glands. He has seen, like others, good success from this treatment, but also cases of rapid generalization, with melanosis and metastases, which explain the traditional distrust that this method inspires in many physicians. He considers electrolysis on the whole the most favorable method of treatment in progressive nevi and nevocarcinomata. Needles are inserted through and beneath the neoplasm, in numerous places, and a current of about four to five milliamperes is passed for from one and one-half to four minutes. It is best to attempt the total necrosis of the tumor in a single sitting. The pain is not unendurable even for infants, and the cicatrix is always less than one expects. He is not so decided as to the proper course to take if the glands have already become affected, but points out the fact that they may sometimes disappear after treatment of the initial neoplasm by electrolysis, as he and others have observed many times. This method does not, of course, apply to cases where there are secondary tumors, a localized or general melanosis, or visceral involvement.

THE NATURE OF RODENT ULCER.

Adamson[2] details four cases of epithelioma adenoides cysticum in one family, showing the resemblance of these cases to rodent ulcer in appearance, distribution and pathological anatomy of the growths. Rodent ulcer, since it was first described by Jacob of Dublin, in 1827, has continued to attract great interest in Great Britain. Most British observers have regarded it as distinct in clinical features and in pathology from other forms of malignant cutaneous epithelioma, while continental dermatologists, with a few exceptions, have not until recently recognized it as a special type of epithelioma. The grounds of the British for considering rodent ulcer a special type are the fact that it does not invade the glands, that histologically the cells are smaller than those of squamous-celled epithelioma, that they were arranged in lobules, and did not form horny cell-nests. It was recognized as an epithelial growth but was refused the name of epithelioma, this latter term being reserved for the growths with malignant ten-

dency containing horny pearls. Some recent German writers consider rodent ulcer to be a special type of epithelioma starting in the hair follicles, and call it tricho-epithelioma. Adamson seeks to support his own view that rodent ulcer is an affection distinct from true malignant carcinoma and that it belongs to the class of nevoid growths, which include adenoma sebaceum and multiple benign cystic epithelioma.

He considers that true carcinoma cannot be regarded as a nevoid growth or as the awakening of embryonic cell remains in Cohnheim's sense. He regards as a striking feature of squamous cell epithelioma, as contrasted with rodent ulcer, the fact that it always(?) arises on skin or mucous membrane that has been previously damaged by injury or long-continued irritation. This includes the so-called "precancerous conditions," which arise in scars from burns, old syphilitic scars or the scars from lupus, chronic irritation of the lower lip from pipe smoking, leucoplakia of the tongue or vulva, the scars of x-ray burns, and perhaps the most common of all, the results of chronic dermatitis produced by frequent exposure to the sunlight and known as keratosis senilis, sailors' skin, etc. The same may be said of carcinoma of the pylorus, gall-duct or gall-bladder, cervix uteri and the lower part of the intestines,—all of which parts are liable to chronic inflammation and ulceration.

In rodent ulcer, on the contrary, the tumors do not arise on parts that have been previously damaged or subjected to continued irritation, but in regions where benign nevoid growths are very apt to occur. Rodent ulcer does not occur on mucous membranes, nor does it invade lymphatic spaces, or glands.

Adamson had previously, in the *Lancet* of Oct. 17, 1908, published an account of two cases of multiple rodent ulcer in which the histological features closely resembled those of benign cystic epithelioma. In both these epithelial growths the cells involved belong to the basal layer of the epidermis, which are normally destined to become pilo-sebaceous follicles. The chief difference is that rodent ulcer usually appears late in life and tends to ulcerate, while the benign form appears in childhood and does not ulcerate. Jarisch was the first to suggest that there was a relationship between the two affections.

Adamson further describes a case of non-ulcerated tumor of the lower eyelid (tricho-epithelioma) present since birth, associated with rodent ulcer of the nasolabial fold, which appeared in middle age. The patient was a man of thirty-seven who had two growths, one on the left lower eyelid, and one on the left nasolabial furrow. He considers that his cases support the view that rodent ulcer is a nevoid growth derived from the basal cell layer of the epidermis, and closely related to the benign tricho-epitheliomata, known as epithelioma adenoides cysticum, and hidradenoma or tricho- epithelioma of the lower eyelid. He regards rodent ulcer as a delayed attempt to form hair follicles and sebaceous glands, and as an illustration of Cohnheim's theory of cell rests. The exceptional occurrence of prickle-cells and of cell nests in typical rodent ulcer, and the fact that in rare instances rodent ulcer may infect the glands, are explained by regarding the rodent ulcer, with its tendency to imperfect repair by scarrings as in itself a precancerous condition, which may in rare cases give rise to epitheliomatous growths, in the same way as the scars of lupus vulgaris. Another objection, that it is not uncommon to find among the squamous-celled epitheliomata of keratosis senilis other growths which are histologically indistinguishable from rodent ulcer,—in other words, true basal-celled epitheliomata, is met with the reply that this does not constitute them rodent ulcers, and it may still be claimed that the fact that they are situated on skin that has been subjected to injury and constant irritation is sufficient to distinguish them from rodent ulcers which originate from embryonic remains of cells, and are not at the sites of injury or constant irritation.

HEALING OF SKIN CANCER WITH SALICYLIC ACID.

Weinbrenner[3] has treated rodent ulcer by applying pure salicylic acid on the affected parts and then covering with Beiersdorf's zinc plaster-mull, and twenty per cent. salicylic acid plaster-mull. The sloughs were removed every second and every third day, the surface bathed with boracic acid solution, and then pure crystallized salicylic acid applied. The result of the treatment is a reddening and swelling of the parts surrounding the lesion, and the tumor,substance is converted into a grayish red, closely adherent slough, which may be pretty easily loosened after two or three days. In the further course of treatment there is a deeper and more extended action, which is accentuated in appearance by the swollen periphery. After the slough has been removed the borders of the ulcer appear indented and irregularly bounded. The cartilage may be attacked, but this tissue and the vessels are, on the whole, relatively resistant. In the case of a woman of sixty-four years, the treatment of a lesion of the ala of the nose by this method showed, after the destruction was finished, cartilage or muscle exposed, as in a perfect anatomical dissection. The pain from this procedure is considerable as long as the process of destruction lasts. On the first application of the salicylic acid there is only slight pain, which becomes considerable in twelve to twenty-four hours, and decreases from day to day, according to the individual susceptibility. In one case the absorption of the drug was demonstrated by its presence in considerable amount in the urine. The action of the salicylic acid on the morbid tissue seems to be elective in so far as the destruction does not progress regularly in every direction, but in cases where the affection is situated on the nose and beneath the eye, it

works downward and toward the sides; in cancer of the abdomen above the umbilicus, upward and towards the sides. The duration of this treatment was in the case of smaller growths two and one-half to three months on an average, eight months in cancer of the abdomen.

GENERALIZED ZOSTER WITH CHANGES IN THE CORD.[4]

Cases of zoster have frequently been reported in which a few scattered vesicles were found outside of the zones of eruption. In a few cases quite numerous lesions have been described, although they are usually few in number.

Von Zumbusch reports a case of generalized zoster observed in Vienna and shown at a meeting of the local medical society. The patient was a man of seventy-four who had been affected with his present trouble for about three weeks, which had been ushered in with very sharp pain in the right side of the chest, followed in a few days by an eruption in the same location. When admitted to the hospital, it was noted that his skin was everywhere slightly atrophic. On the right side of the thorax at the level of the sixth and seventh ribs, the skin was dark colored, dry, and covered with irregularly formed, rather superficial, ulcers of various sizes, showing often the confluence of two or more. Over the whole body there were scattered foci of the same eruption, which spared only the face and forehead. There were many lesions on the breasts, loins, scalp, shoulders, arms and legs. They were in irregular groups and showed nowhere a characteristic arrangement. There were more than 200 foci seen. They were in type small vesicles or pustules, often covered with a black necrotic crust. Fibrillary muscle twitching of the shoulders, abdomen and lower extremities and loss of the right patellar reflex were noted. The patient died suddenly the third day after admission.

At the autopsy an infiltration such as is commonly described as occurring in zoster was found in all the ganglia examined. The peculiarity of the infiltration lay less in its composition than in its topical arrangement. While some of the ganglia, especially those of the middle and lower portions of the cord at the part examined showed a diffuse, and in places very tense infiltration, in other ganglia these infiltrations were more localized in isolated, circumscribed places. Some of the cells were seen to be completely destroyed by this dense infiltration. It was also noteworthy that the infiltration extended to the posterior roots and the connective tissue sheaths and also to the meninges. The posterior horns were, however, the parts most affected, showing moderate irritation in all segments; the middle of the dorsal region being most prominently affected, although without any evidence of severe destruction. The anterior horns were affected in relatively few segments. Slight changes only were found in the white substance.

All of these findings point to a primary zoster following an inflammation of the spinal ganglia. The fact that all of the ganglia were not infiltrated to the same extent would explain the varied distribution of the lesions. From this inflammation of the ganglia, the process had spread along the posterior roots and their vessels into the pia and posterior horns and given rise to a process similar histologically to a poliomyelitis. Although this case cannot decide the question of the identity of zoster and poliomyelitis, it nevertheless demonstrates that the zoster process is not limited to the spinal ganglia or the peripheral nerves, but may also break through the boundaries and affect the cord itself. The foregoing case is similar to some others that have been reported, but is remarkable for its severity and for the large number of aberrant vesicles, over 200 in number, more than has ever been noted before. Also it is very seldom that zoster is the cause of death, although in this case the age of the subject is to be taken into account. The author thinks also that the degeneration in the posterior columns should be looked on as a senile change, rather than as due to the zoster.

TREATMENT OF PRURIGINOUS DERMATOSES WITH NORMAL SERUM.[5]

Ullmann, in Neisser's clinic at Breslau, stimulated by the favorable results reported by Linser, treated eighteen cases of pruriginous dermatoses with injections of normal serum. Linser's experiments were incited by the results reported in herpes gestationis, and other dermatoses connected with the puerperal state by the injection of serum from puerperal and normal subjects. Linser's results included the complete cure of two out of six cases of pemphigus. Ullmann's cases were drawn from those that had proved rebellious for a long time to all local and internal treatment, and had continually recurred. During the serum treatment all other therapeutic measures were bandoned, and in the case of persons in whom psychical effects might be expected, small quantities of salt solution were injected between the treatments, without the patient's knowledge.

The serum was obtained chiefly from young, strong men, who exhibited clinically no trace of internal disease, and who showed a negative Wassermann. No unpleasant accidents were experienced during the injections, and the general condition was in no wise influenced. The experiments concerned seven cases of dermatitis herpetiformis, two cases of generalized eczema in children, three cases of urticaria, four cases of pruritus of undetermined causation, one case of prurigo, one case of pemphigus vulgaris.

The results were as follows: No influence on the course of the affection was attained in the two cases of infantile eczema. Neither the pathological anatomical alterations, nor the pruritus were ameliorated, although both cases were healed rapidly later on by local therapeutic

measures. Similarly, with regard to the cases of dermatitis herpetiformis, neither the itching, the existing efflorescences, nor the tendency to recurrence were affected in the least by the injections. On the other hand, a diminution of the pruritus was attained in two of the cases of urticaria after the injections, although a complete disappearance could be claimed in no instance, and a recurrence was not prevented. The most favorable results were attained in purely nervous pruritus. The four cases treated were dismissed after the treatment with a very marked improvement in the tendency to itch. In these cases the psychical element must be taken into account. In the single case of prurigo Hebra treated, the itching was greatly benefited.

The writer, in summing up, declares that no results were obtained from the use of normal human serum in dermatitis herpetiformis, but that a favorable influence on the pruritus was shown in the case of those dermatoses which rest on a purely nervous functional basis. In the case of other pruriginous skin affections, such as prurigo and urticaria, the itching may be favorably influenced, but there is no definite improvement or lasting cure. He agrees with Lanser that the serum injections have no influence on the general condition of the subjects, and he has never seen any signs of anaphylaxis. It is in great measure on account of this attribute of safety that he considers it justifiable to resort to this method of treatment in those cases of universal dermatosis which have defied other therapeutic measures. He thinks that the percentage of successes will be increased if this method of treatment by the intravenous injection of normal human serum is confined to the class of toxic dermatoses, to the exclusion of all forms of eczema, psoriasis, and those affections that begin with the formation of bullae.

TINEA IMBRICATA.

Castellani[6], director of the government clinic for tropical diseases in Colombo, Ceylon, who has been prominent in his researches in the field of tropical diseases, describes the result of his experience in the affection called tinea imbricata by Manson, which has received a number of different names in the localities where it has appeared. He defines the affection as a tropical dermatomycosis, or more correctly, a group of dermatomycoses, due to fungi of the genus Endodermophyton, clinically characterized by extensive flaky, scaly patches, the scales being large, tissue-paper-like, firmly adherent by their bases, and arranged in concentric rings or parallel lines.

It seems to have been first referred to in 1789. In 1874 Tilbury Fox gave a good description of it under the name Tokelaun ringworm, considering it to be similar to, if not identical with, the fungus of European ringworm. Castellani thinks that the organism described by Tilbury Fox was an aspergillus-like contamination. After that time discussions began as to whether the disease was a separate affection or merely European ringworm modified by varying climatic conditions. The majority of European observers were inclined to consider it a variety of ringworm, while those who practised in the tropics regarded it as a distinct disease.

Tinea imbricata seems to have started in the Malay peninsula, from which it spread south and east to many islands of the South Pacific, northward to parts of China, and westward to Burmah and Ceylon. At present from one-third to one-half of the population is affected in certain of the Pacific Islands. It is common in parts of the Philippines. It appears to have made its appearance in Ceylon in 1904, in which year Castellani recorded the first case. Since then it has spread, and is now fairly common in the islands, although not so much so as in the Malay Peninsula and in Fiji.

A warm, damp, equable climate with a temperature of 80°-90° F. seems to be most favorable to the development and spread of the disease,—the same climate, as has been pointed out by Manson, that is most favorable to the growth of cocoanuts; in fact the geographical distribution of tinea imbricata corresponds almost exactly to the districts where cocoanuts thrive. It is not prevalent in places which have a cool or cold season, in addition to an extremely hot one.

Manson inoculated scales on normal individuals and reproduced the disease typically. He made a series of inoculations and showed that the disease always presented the same characteristics and never those of ringworm, and therefore regarded it as a distinct disease. Castellani dissents from the view that the genus aspergillus and similar ones are the cause of the disease. By using a special technic he has succeeded in growing the true fungi causing the disease, which he has proved by reproducing the affection in human beings by inoculating with pure cultures. He suggests for these fungi the generic name endodermophyton, and maintains that there are a number of species of these fungi, as is the case with tinea corporis. Thus far he has succeeded in growing two species.

In Ceylon the species is most common in young adults, attacking women more frequently than men, country people more often than those who live in cities. There does not seem to be any racial predisposition. Beginning as one or several small, round, slightly raised, pruritic patches, it soon takes the form of concentric scaling rings. In a well-marked, advanced case the skin of practically the whole body is covered with round patches, each of which presents several concentric, not inflamed, scaly rings. The scales are flaky, resembling tissue paper, of large size, dry, of a dirty grayish color, and slightly curled. The largest scales are usually on the back. Any part of the body may be affected, except the scalp. The general health is not much affected, but the patients complain of the disfigurement and of great pruritus. The

fungus never invades the hair follicles. Inoculation experiments, either from the scales or from pure cultures are easily successful in from 8 to 20 days. In some instances the affection becomes diffuse and resembles ichthyosis.

The disease has no tendency to spontaneous cure and the treatment is difficult. Pain, itching and the disfigurement are chiefly complained of. In advanced cases coolies are unable to work on account of the extreme pruritus. Castellani has experimented with various modes of treatment, and has found on the whole the application of strong liniment iodi, or resorcin dissolved in tincture benzoini (resorcin ʒii, tr. benz. ʒi), chrysarobin ointment (5-10%), the most satisfactory routine treatment. When chrysarobin is used the patient must be carefully watched, and the urine regularly examined. In one case symptoms of absorption appeared after a single application.

With regard to prophylaxis, Castellani points out that isolation is hardly practicable in cases where a very large number of people are affected. In places where the affection has not yet appeared much may be accomplished by the medical officer keeping on the watch for its appearance and promptly isolating the first cases discovered, and boiling or burning all infected clothing. An epidemic was observed in a hospital in which a patient suffering from the disease was allowed to enter and mix with the other patients. The natives believe that anointing the body with cocoanut or other oil is a preventive. While the treatment of an advanced case of tinea inbricata is extremely difficult, it is easy to stop it in its initial stages by treating the early lesions by applications of liniodi, chrysarobin ointment, or resorcin dissolved in tr. benzoini.

REFERENCES.

[1] Bulletin de l'Association Française du Cancer, Nov. 21, 1913.
[2] Lancet. London, March 21, 1914.
[3] München. Med. Wochensch., Jan. 20, 1914.
[4] Archiv f. Derm. de Syph., März, 1914.
[5] Archiv f. Derm. u. Syph., Sept., 1913.
[6] British Journal of Dermatology, Dec., 1913.

Reports of Societies.

AMERICAN SURGICAL ASSOCIATION.

ANNUAL MEETING, HELD IN THE ASTOR HOTEL, NEW YORK CITY, N. Y., APRIL 9TH, 10TH AND 11TH, 1914.

The President, DR. WILLIAM J. MAYO, in the chair.

THE PROPHYLAXIS OF CANCER.

DR. WILLIAM J. MAYO, Rochester, Minn.: All vertebrate animals suffer from cancer in situations affected by their habits or conditions of life, leading to local lesions in the protective mechanism. We should look upon local lesions as an invitation to cancer without regard to just what the actual cause of cancer may be. The term precancerous should be limited to those conditions which clinically and microscopically cannot be said to be surely benign or surely malignant. The character of the cells are changed; they lack differentiation, but as yet there is no infiltration of the surrounding tissue. This cellular change is found in the periphery of malignant growths and in conditions which have afterward developed malignancy. The local lesion is the invitation and the precancerous condition the probable acceptance.

Sites of local irritation are divided into three groups: (1) congenital, or acquired neoplasms, such as moles, warts and benign tumors, which may undergo malignancy; (2) trauma, which strongly influences not only the development of sarcoma, but of carcinoma; (3) chronic irritation, which I consider the most important of all the precancerous conditions, whether the result of mechanical, chemical, or infectious agencies. Among the many examples cited are the development of cancer in the mouth from betel-nut irritation in India, amounting to nearly half of all the epithelial cancers of the country: the development of cancer in local lesions produced by heat, as cancer of the lip from smoking, the "Kangri" sores following burns, which form more than 50% of all cancers in Kashmir; those cancers on the shins of locomotive drivers who have been exposed for years to the direct action of heat; cancers following chronic irritation due to different forms of radiant energy, x-ray, etc.; cancers following the local lesions due to infections, such as Bilharzia of the bladder, treponema pallidum in keratosis linguae, nematodes in testicular tumors in horses and in gastric cancer of rats; and the "horn-core" cancer of cattle, due to the irritation of the ropes through the horns with which the cattle pull their loads. If the betel nut were not used in India and the Kangri basket in Kashmir, the cancers in these two countries would be reduced one-half.

It is important to apply the evidences of local chronic irritation in the production of cancer to the solution of problems as regards the development of cancers on the internal mucous surfaces of the body. For example, cancer of the gall-bladder from gall-stone irritations and cancer of the stomach following gastric ulcer. Fifty per cent. of cancers of the pelvis of the kidney are demonstrably superimposed on extensive renal calculi formation. Carcinoma of the appendix usually occurs in association with chronic obliterative processes. In the sigmoid and rectum, the irritation in diverticula may have given rise to malignant disease. Cancer of the stomach occurs in 30% of all cancers in civilized man, but is not common in primitive races or in lower animals. When cancer of a certain organ is found in only one class of individuals or one species, it means a single cause, like betel-nut cancer and Kangri cancers. Cancer of the stomach must be due to one cause; if many, the lower animals and primitive races would be more often affected. Something in the habits and customs of civilized man in connection with the cooking and preparation of food must be responsible for this large percentage of cancer of the stomach.

SOME PROBLEMS IN THE EARLY DIAGNOSIS AND TREATMENT OF SARCOMA OF THE LONG BONES.

DR. WILLIAM B. COLEY, New York City: The results are submitted of 121 cases coming under per-

sonal observation. Of the cases in which the mixed toxin treatment was used either before amputation in the hope of saving the limb, or immediately thereafter in the hope of preventing recurrence, 19 have remained well for from three to fifteen years. In the cases in which the toxins were not used 4 have remained well for over three years. Attention is called to the extreme malignancy of sarcoma of the long bones, especially of periosteal sarcoma. Of the older statistics quoted by Butlin nearly a generation ago, in 143 cases of periosteal sarcoma of the long bones, only one remained well after three years from date of operation. In all these cases most radical operation was performed,—high amputation; and in femur cases, at the hip-joint. The most recent and very valuable statistics published were in the discussion before the Royal Society of Medicine in London two years ago on Sarcoma of the Long Bones. Of 106 cases observed in the last decade at St. Thomas's Hospital in London 53 were suffering from periosteal sarcoma, and only one of these remained well three years after operation. Of the total number of cases, including the central or myeloid type, only ten were alive and well three years after operation. A very important point is that the preliminary use of the mixed toxins has resulted in the saving of the limb in nine cases in my own experience. Combining this with the experience of other men, the toxins have proved successful in about twenty cases. The results of this series of cases I believe establishes beyond reasonable doubt the advantages of the preliminary use of the toxins before sacrificing the limb; and, after operation, as a prophylactic against recurrence.

Early diagnosis requires accurate clinical knowledge of all the conditions most likely to stimulate sarcoma, and also a great amount of actual examination and careful clinical study of a large number of cases of sarcoma of the long bones. The tactile sense is of inestimable diagnostic value. While the x-ray may often be misleading in the early stages of sarcoma of the long bones, it may also be of valuable help in making early diagnosis, and large experience in interpreting the x-ray is required. In periosteal sarcoma there are lesions that closely simulate sarcoma, especially in the non-ossifying type. Tuberculosis, syphilis and chronic osteitis may simulate this condition, and here the x-ray is of very great help. In such cases the tendency of new bone to form spicules which stand out or radiate at right angles to the shaft of the bone is regarded by many authorities characteristic of sarcoma. Personally, however, I have observed many important exceptions to this rule. The advantages and disadvantages of exploratory operation and microscopical examination of the specimen removed are discussed at length. With the history and clinical signs strongly positive I would not subject the patient to the risk of an exploratory operation, but would immediately perform the operation indicated. Upon two such occasions I did total excision of the clavicle for a rapidly growing periosteal tumor of only three weeks' duration. Another group of cases in which I would not do an exploratory operation is that in which, though the clinical evidence be less strong, the anatomical location of the tumor might render probable severe hemorrhage, and a sinus difficult to heal. Exploratory operation is indicated in cases of sarcoma of the upper end of the tibia or lower end of the radius in which it is most important to know the type of tumor being dealt with. The exploratory operation is also indicated in periosteal sarcoma of both the shaft and the extremities of the long bones, especially in the early stages. The chief requirements for the early diagnosis of sarcoma of the long bones may be summarized as follows:—

1. A more careful study of all known clinical data.
2. A large clinical experience in the diagnosis of sarcoma of the long bones.
3. Early x-ray examinations in all suspected swellings of the long bones, especially those following trauma.
4. Exploratory operations and microscopical examinations of the tissue removed in selected cases, but not as a routine measure.
5. The importance of not placing implicit reliance upon the negative report of the pathologist, especially when in conflict with clinical and x-ray evidence that is strongly positive.

DISCUSSION.

Dr. C. A. Porter, Boston: In a case of sarcoma of the upper lumbar vertebra in a boy of 19 the condition at operation was found to be typical giant-cell sarcoma. Curetting would have been ineffective. There was free bleeding and the wound was packed. Large doses of the Coley toxins were given and the boy is perfectly well one year and a half since operation.

Dr. John H. Gibbon, Philadelphia: I have had one case of periosteal spindle cell sarcoma in a girl of 17; prompt recurrence after incomplete operation, refusal of shoulder joint amputation. She was then given the toxins and x-rays. It has now been five years with absolutely no evidence of recurrence. The woman has since married and borne a child. In another case my assistant at the Pennsylvania Hospital, Dr. Allen, operated for a recurrent spindle cell sarcoma of the forearm. Prompt recurrence taking place, the patient was put on the toxins and x-ray treatment. The growth melted under it, and at present, eight or nine months since the treatment was started, there is no evidence of recurrence. I use the toxins in every case of inoperable sarcoma.

Dr. Thomas W. Huntington, San Francisco: I am able to report two satisfactory cases treated with the Coley toxins. In each case I began with infinitesimal doses; in one case after extirpation of the clavicle. While the objection may be made that the operation cured the patient, it has now been six or seven years since treatment, which extended over six months, and there has been no recurrence. The second case was a large spindle cell sarcoma following in six months the kick of a horse in the muscles of the right thigh. The tumor was removed by the physician in the country, but it immediately returned. I did an extensive operation and placed the patient upon infinitesimal doses of the toxins, increasing these to the point of tolerance. The patient has now been well for about a year, and reports that in every respect his condition is satisfactory.

Dr. Archibald MacLaren, St. Paul, Minn.: My partner, Dr. T. deWitt, who studied with Dr. Coley, from a case of erysipelas drew his own toxins, and using them obtained a real result. In one case of partial removal of a spindle cell sarcoma of the parotid treated by the toxins there was recurrence inside of a year. Under the toxins the growth entirely disappeared. There was again a return, which disappeared after an ordinary attack of typhoid fever. In five years the woman died with general

sarcomatosis, so that the original condition must have been sarcoma. There is no question that the growth disappeared after typhoid fever, nor is there any question of its complete disappearance under the administration of the toxins. Now, what was it?

DR. HOWARD LILJENTHAL, New York: I believe in the post-operative use of Coley toxins in every case of sarcoma and also in cases of carcinoma of the breast. I have used the toxins regularly and consistently. I have had fewer recurrences than I thought possible.

DR. WILLIAM L. RODMAN, Philadelphia: I have had no case of recovery after the use of the toxins for lesions in the long bones; yet I have had cases in which the condition was improved after the use of the toxins when the lesions were in the throat, and in one case in the parotid gland. The most marked case I have ever seen of benefit or relief was a patient of Dr. Kuhn of Louisville. Dr. Kuhn had operated five or six times on a young man of 20, the growth promptly returning after each operation. I was asked to see the case in consultation. I suggested the use of toxins and furnished the preparation. The young man is now a practicing physician and is well in every way. The condition occurred 16 years ago. In another case of sarcoma of the parotid the patient came under my care subsequent to two operations. Upon telling her that the third operation would be more extensive than the first two with almost certainly paralysis of the face, she declined the third operation. I used the toxins with complete disappearance of the growth, and so far as I know, the patient is well at this time. I have seen many other cases operated in which I believe, had the treatment been persistently carried out, complete cure would have resulted. I have not seen any good results from the use of the toxins in carcinoma.

DR. N. B. CARSON, St. Louis: In a patient seen many years ago with a tumor under the clavicle with a diagnosis of sarcoma, a second operation was refused. We used the Coley toxins and the tumor gradually disappeared. I was able to follow the patient for a number of years after the injections and there was no return when last heard of. In another case in the practice of a colleague, the whole lower abdomen was filled with what was taken to be a sarcoma. Under the use of Coley toxins the tumor gradually disappeared and the patient was well three years after treatment. I have at present the case of a young doctor who had a sarcoma of the humerus operated on when I first saw him and which recurred. The infection had involved the shoulder. I did a second operation and have been using the Coley toxins, and on the anniversary of the operation he writes that he is perfectly well and doing a large practice. I have sometimes used the toxins in sarcoma without success; and, frequently in carcinoma with no success whatever.

DR. WILLY MEYER, New York City: The point mentioned by many speakers, of the Coley toxins having no effect in carcinoma, is substantiated in my observation, neither has it any effect in endothelioma. It has been my peculiar misfortune to have two patients with small tumors on the back simulating atheroma. In the one case which I operated the condition was endothelioma. In another case the patient, a man, had at the same time, a scirrhus of the breast. In these cases the toxins had no effect. In another case of sarcoma of the chest there were all the typical symptoms of tumor in the anterior mediastinum,—compression of veins, etc. The patient, a doctor, insisted upon thoracotomy. I asked him to first see Dr. Coley. After discouragement because of fever and chills, he again asked for operation. I again dissuaded him. Dr. Coley not long ago told me that this patient had written him that he was so much better that he wanted to continue the treatment at his own home. There is no doubt that sarcoma, and inoperable sarcoma, particularly, needs the Coley toxins besides the x-ray treatment.

DR. STANLEY STILLMAN, San Francisco: In a case of sarcoma of the chest wall attributed to the irritation produced by leaning over a boat in fishing, the tumor entirely disappeared upon the Coley toxins. The man, however, had mediastinal metastasis, and died just as we thought he was getting well; the parent growth entirely disappeared. It is important to remember in connection with Dr. Coley's paper that periosteal sarcomata are rarely recovered from. In my own experience, the cases amputated or disarticulated without the use of the Coley toxins died generally within one year. After amputation the use of the toxins may produce recovery.

DR. CHARLES H. PECK, New York: I would like to add the report of one case of incompletely removed sarcoma of the sub-maxillary region operated upon five years ago which was treated afterwards with the Coley toxins and was followed by a complete cure. I have used the toxins in a number of cases but this is the only one with beneficial results.

DR. JOHN B. MURPHY, Chicago. We are indebted to Dr. Coley for keeping alive an element of hope in showing that there is something that we do not understand, and that does occasionally produce an alteration in the clinical course, and that occasionally brings a good result. In the history of sarcoma we find many things influencing cases positively sarcomatous that have recovered, that Dr. Coley has kept to a system, and that that system shows that something produces a change in the cells. We have learned from Abderhalden that the protoplasm of each individual cell produces an enzyme and that enzyme has a specific inhibiting effect in the blood. That seems to me to be the line in which Dr. Coley's splendid work for so many years has directed us, and in which we should have hope.

DR. ARTHUR DEAN BEVAN, Chicago: I think Dr. Cole is entitled to a great deal of credit, and I would second very emphatically Dr. Murphy's statement to this effect, that he has for many years persistently carried on this work and has placed it on a thorough going basis. I am prepared to accept the fact that in the course of thousands of cases a limited small number, which if all of the cases were taken into consideration, amount to a considerable number but small percentage, have been influenced by the use of toxins. The important thing for us to determine is the possibility of this treatment in malignant disease. In 75 or 100 cases I have never seen a cure from the use of the toxins in either carcinoma or sarcoma. I have seen marked effects and I continue to use the toxins in inoperable cases. In my experience the x-ray has been of very much more benefit in both inoperable carcinoma and sarcoma than the toxins. I believe both should be employed, but with the estimate upon the toxins, that they simply give a possibility, not any great assurance of benefit.

Dr. Charles F. Stokes, Washington, D. C.: Some thirteen years ago in a case that had had an appendectomy a sinus persisted and at the site of operation a sarcoma developed. I was communicated with and suggested the use of the Coley toxins. Reply came back that the patient was in the hands of Dr. Feyleisen, and that he did not approve of this method of treatment in this case.

Dr. William J. Mayo, Rochester: I think the Association is to be heartily congratulated upon having a Fellow with the courage of Dr. Coley to carry this thing to the present time under the very great discouragements that have existed.

Dr. Coley, closing: I had little idea that the paper would provoke such a splendid discussion and so favorable a one. Despite the serious discouragements, no one can see the benefit in the cases that were hopelessly inoperable without believing there is something valuable in the toxins, and with that belief I have been obliged to continue the work. I have been inspired to continue by such splendid support as I have received from Dr. Gerster, Dr. Mayo, Dr. Lilienthal, and others.

THE TWO-STAGE OPERATION, ESPECIALLY IN ITS RELATION TO TREATMENT OF CANCER.

Dr. George W. Crile, Cleveland, O.: The newer developments in surgical technic, by which most of the danger and most of the suffering and discomfort, even of surgical operations, have been eliminated, have enabled the surgeon to fully utilize the advantages of two-stage operations for cases heavily handicapped by lowered vitality, while in cancer cases the danger of immediate re-implantation is minimized.

Critical cases of acute infections of the pelvis, of the appendix, or of the gall-bladder, may be more safely treated by a preliminary drainage, the operation being completed after the margin of safety has widened.

If we adjust the operation to the patient, rather than the patient to the operation, I believe we shall greatly reduce the mortality rate which now accompanies the surgical treatment for cancer of the stomach, intestines, larynx and tongue.

Dr. Fred B. Lund, Boston: I have employed the two-stage operation in ulcer and cancer of the stomach only in cases in which the patient was very weak. In cases in which there is doubt of the diagnosis of cancer I would be more inclined to use the two-stage method than in those in which I was sure of cancer, because not only may cancer progress during the waiting stage, but it may be more extensive than anticipated, and the adhesions from the previous gastroenterostomy may hamper a thorough operation at the second stage. In cases in which resection is easy, the patient in good condition, I should never think of the two-stage operation in undoubted cancer of the stomach.

Dr. James E. Moore, Minneapolis: I have for a long time been a firm advocate of the two stage operation in selected cases. I know of no more satisfactory procedure than, with enlarged prostate and infected bladder where ether anesthesia would be fatal, under a local anesthetic, to make a small incision suprapubically and drain the bladder. I am also in accord with Dr. Crile in reference to appendectomies. There is a strong tendency to undertake too much and to interfere with some of the undertakings of the Almighty. Many times have I opened a large abscess and not being able to find the appendix without ripping things up, have left it, had my patient recover, did a second operation followed again by recovery.

Dr. Howard Lilienthal, New York: It is now five years since I emphasized in a paper published in the *Annals of Surgery* in 1910 what I thought was the importance of the two-stage operation in resection of the pylorus. Since then I have concluded that the method is even more valuable than I at first thought. In ulcer cases particularly it is of importance. Some years ago I undertook a two-stage pylorectomy in which a large tumor the size of a duck's egg disappeared in two weeks. I let the patient go and he came back with a recrudescence undergoing carcinomatous change. I operated on him and he got well. By making a median incision, or even a left-sided incision for the gastroenterostomy, by examining the pylorus with great gentleness, using no gauze or other packing, there will be no adhesions at the time of the second operation. I am going to perform such a second-stage operation on Saturday afternoon on a man who had a nodule in his pylorus at the first operation, and whether still there or not, I am going to take out the pylorus.

Dr. Arpad G. Gerster, New York: There is not a doubt that the two-stage operation, where indicated by special conditions, is a very useful expedient, but the argument advanced by Dr. Moore, that in appendicitis we are doing too much and thus interfering with the designs of the Lord, might be applied to all surgery, which is all an interference with the designs of the Lord. There is a great difference between doing a two-stage operation where necessary, and doing it under all circumstances. I believe the broad application of this principle as a routine is entirely unnecessary. If I ever have to be operated on I shall be willing to run a little additional risk in order to get through at one clip. An extended experience in surgery demonstrates that in the majority of all major cases the two-stage operation is unnecessary. We ought to diminish the anguish and suffering to which the patient is subjected by an unnecessary operation. Further, it would hamper the hospital surgeon to a tremendous extent when ten or fifteen patients must be operated upon in three or four hours.

Dr. Frederic Kammerer, New York: With regard to the two-stage operation in tumors of the pylorus,--we have all done a gastroenterostomy for such tumors in cases in which the tumors have disappeared, being purely inflammatory in type. I have done the secondary operation in three cases in which no tumor remained. My experience in carcinoma differs from that of Dr. Lilienthal, for after a gastroenterostomy at the first stage, I have found the removal of the tumor at the second stage much complicated. It is my belief, especially when we consider that these patients, although with low hemoglobin count, will stand an operation remarkably well, that it is better and easier to do a resection and gastroenterostomy at one time.

Dr. Alexander Primrose, Toronto: While Dr. Crile has shown us that the two-stage operation has a very valuable application, I quite agree with Dr. Gerster that it should not be the routine method of procedure. For example, Dr. Crile spoke of the value of drainage of loops of gangrenous bowel; here I would take issue with him under certain conditions, and in illustration would refer to volvulus high up in the small bowel where the gangrenous area existed within some twelve inches of

the duodeno-jejunal juncture; there the excision of the bowel was made, or rather, drainage with partial excision because no further operation could be done, and we had here the further difficulty of nutrition to contend with. We were compelled to do a second operation in twelve days, and the condition of adhesions was such that the operation was exceedingly difficult and the patient succumbed. We could have possibly saved this life if we could have performed immediate operation in the first stage. Another case of volvulus of the small intestine occurring at a lower point occurs to me in which the bowel was gangrenous. Resection and anastomosis were followed by recovery. I would also take issue in acute appendicitis. I think the gangrenous and septic appendix is a source of great danger and should be removed if at all possible to get it out. My experience is that there is trouble locally with also danger of spreading infection along the lymphatics with resulting subphrenic abscess when the appendix is left in and the abscess drained.

DR. CRILE, closing: Of course I do not propose the two-stage operation for everything, but naturally, for the healthy risks which I stated at the beginning of my paper. The discussion centers down to two questions,—what shall we do with the acute infections, and how shall we operate in cases of carcinoma. The only way to determine whether it is best to break down the walls of adhesions in a circumscribed abscess in acute appendicitis is to make a long series of observations. We can show over 200 cases of all sorts of acute appendices, not those in which the resections are easy, but all kinds of cases, without a fatality.

SYSTEMIC BLASTOMYCOSIS.

DR. CHARLES A. POWERS, Denver: The paper gives the history, pathological conditions, course and ordinary termination of the disease. Two cases are cited, both of which were fatal. The first had been studied bacteriologically for nearly two years, the cultures of the micro-organism being carried successively from one animal to another. Blastomycosis generally results in death when it becomes systemic. Prolonged and increasing doses of potassium iodide and of cupric sulphate may possibly be of value. The condition generally begins with cutaneous or subcutaneous lesions and generalization may be prevented by very early and very wide excision of the affected tissues. Early diagnosis of the cutaneous and subcutaneous condition is, therefore, of prime importance. Interesting facts derived from one of my cases, regarding the botany of the organism, have been presented by Dr. Whitman, professor of pathology in the University of Colorado, in the *Journal of Infectious Diseases*, Vol. xiii, July, 1913. I strongly advise early, thorough and wide excision of all blastomycetic lesions, when this be possible, with a view to preventing their generalization.

DR. ARTHUR DEAN BEVAN, Chicago: Shortly after Gilchrist announced his first case of this disease I saw a case, which was reported in the literature as the Hektoen-Hyde-Bevan case, at which time there were only two or three in the literature. Dr. Hyde, the dermatologist, referred the case to me for extirpation of the lesion, with the understanding that he was uncertain whether it was the tubercle bacillus or the spirocheta pallida. I extirpated an extensive lesion in the arm, submitted it to Dr. Hektoen and he isolated the yeast fungus. Our attempts to grow this were unsuccessful. I tried a series of experiments on this particular case with bichloride of mercury internally, with no effect; potassium iodide with marked effect,—an extensive lesion clearing up almost entirely as we find a gumma disappearing under the iodide. In a considerable series of cases, however, this was not always true, but the drug had a marked effect on the organism. Later we used copper with some effect. My colleague, Dr. Ormsby, has collected from the literature 100 cases,—some 80 local, and about 20 cases of systemic blastomycosis which he has actually seen and in which he has obtained a number of postmortems. These cases are more frequent than is generally recognized. The Germans for a long time doubted the existence of this lesion, but it is quite as definite as syphilis or tuberculosis. Treatment rests upon the use of potassium iodide plus the x-ray, and by this treatment nearly all local cases are curable. So far none of the systemic cases under the observation of Dr. Ormsby and myself has gone on to recovery.

DR. N. B. CARSON, St. Louis: Sometime ago we seemed to have an epidemic of blastomycosis and two or three of the cases were of the systemic type, all of which died. They seemed to tolerate drugs very badly. We tried varying forms of treatment and in the local cases with very good results.

DR. EMMET RIXFORD, San Francisco: I fear there is some little confusion on this subject in the minds of some of the speakers. The term blastomycosis is given to this disease which Dr. Powers and Dr. McNeil have reported. The organism is very different from the blastomyces, that is, the fungus which multiplies by budding. The cases mentioned by Dr. Bevan were cases of true blastomycosis. The disease reported by Dr. Powers is entirely limited to California and to a single valley,—San Joachim valley. The first case was found by myself in 1894. Dr. Gilchrist confirmed our observations as to the character of the organisms, which I thought were coccidiae. Dr. Stiles of Washington, to whom the material was then submitted, gave the name coccidiodes. Shortly thereafter we found a second case, in which the organism was distinctly different, as were also the clinical manifestations. The organism in this second case was much larger. There was high fever, great depression, and death occurred within six weeks of the first manifestation of the lesion. In the first case, which lasted two years, nothing did any good except vigorous local surgical procedures. Before the man died his face, eyes, and mouth were destroyed. There were lesions in his bones and at autopsy his lungs were found to be completely consolidated with innumerable white tubercles about the size of oldish miliary tubercles. The adrenals were as large as duck's eggs and consolidated with caseous material.

(To be continued.)

Book Reviews.

The Ready Reference Hand-book of Diseases of the Skin. By GEORGE THOMAS JACKSON, M.D., professor of dermatology in the College of Physicians and Surgeons, medical department

of Columbia University, New York. Seventh edition, thoroughly revised. 12 mo, pp. 770, with 115 engravings and 6 colored plates. Philadelphia and New York: Lea and Febiger. 1914.

The seventh edition of Dr. Jackson's admirable Ready Reference Hand-book of Diseases of the Skin illustrates the rate of growth of the subject of dermatology. The first edition, published in 1902, contained 502 pages, discussing 164 diseases. This edition comprises 726 pages, describing 257 diseases, although there has been much weeding out of obsolete matter. New sections have been added on fifteen new affections, and many of the old sections have been entirely rewritten. Drs. Engmann, Fordyce and MacKee have contributed articles on vaccines, salvarsan, and the use of the x-rays, respectively. There are some admirable new illustrations, in marked contrast to the old reproductions from the classical authors.

Auricular Flutter. By WILLIAM THOMAS RITCHIE, M.D., F.R.C.P.E., F.R.S.E. Edinburgh and London: W. Green and Son. 1914.

This valuable monograph by a Scottish expert aims to illustrate the physiologic, pathologic, and clinical facts relating to auricular flutter, or extreme acceleration of the auricles, by cases from the author's own experience. It is further illustrated by 107 figures and 21 plates, chiefly electrocardiograms. The recent development of this method of investigating cardiac irregularities and disturbances makes this book particularly timely and useful to students and internist practitioners.

Text-Book of Local Anesthesia. For Students and Practitioners. By PROF. DR. GEORG HIRSCHEL, Heidelberg. Translated by RONALD F. S. KROHN, M.D., Lond. New York: William Wood and Company. 1914.

The growing importance and use of local anesthesia in surgical procedures, made possible by the careful elaboration of its technic, gives particular value and timeliness to the English translation of this excellent German monograph. Beginning with the pioneer work of Braun, the author undertakes to collate all known and tested facts relating to the subject. A notable merit of his book lies in the admirable and valuable series of 103 anatomic figures with which the text is illustrated, chiefly taken from the atlases of Spaetholz, Corning, Hasse, Toldt, and Fischer. There is an introductory preface by Professor Dr. Wilms, and a copious alphabetic bibliography. This book should prove almost indispensable to surgeons who wish intelligently to avail themselves of the newest methods and possibilities of local anesthesia.

Renal Diagnosis in Medicine and Surgery. By DR. VICTOR BLUM, tutor in urology at the University of Vienna. English translation by WILFRED B. CHRISTOPHERSON. New York: William Wood and Company. 1914.

This is an admirable English version of Blum's monograph, "Nierenphysiologie und Funktionelle Nierendiagnostik, im Dienste der Nierenchirurgie und der internen Klinik." It aims to be "a handbook of the theory and practice of functional testing of the kidney." It gives a historic review of the early work in functional renal diagnosis and a description of its present condition, illustrated by examples from the author's clinical experience. There are 16 good figures in the text, and an excellent alphabetic bibliography and brief index. Though literal, the translation is clear and idiomatic, and the book should prove useful to practitioners in the field of renal diagnosis.

Nurses for Our Neighbors. By ALFRED WORCESTER, A.M., M.D. Boston and New York: Houghton Mifflin Company. 1914.

This volume of essays is written in the author's familiar and most charming style. The second of the series, on "Medical Methods Old and New," was first published in the issue of the JOURNAL for Feb. 1, 1912, under the title of "Past and Present Methods in the Practice of Medicine." Some of the other chapters have been printed elsewhere, but most of the book is new. Dr. Worcester's long experience in the training of nurses, and his wide sympathy and insight into their problems and those of human suffering, give his work an especial authority and compelling grace. It should be read by nurses and physicians alike, and by the public which knows and understands altogether too little of the higher aspects of nursing.

Blood-Pressure in Medicine and Surgery. By EDWARD H. GOODMAN, M.D. Illustrated. Philadelphia and New York: Lea and Febiger. 1914.

This book aims to be "a guide for students and practitioners," "to make fully available the assistance which the study of blood-pressure affords in the diagnosis, prognosis and treatment of disease." It is clearly written and well illustrated with 57 figures in the text, and should prove a useful manual and text-book on an important and hitherto much neglected subject.

THE BOSTON

Medical and Surgical Journal

THURSDAY, AUGUST 20, 1914.

A Journal of Medicine, Surgery and Allied Sciences, published at Boston, weekly, by the undersigned.

SUBSCRIPTION TERMS: *$5.00 per year, in advance, postage paid, for the United States. $6.56 per year for all foreign countries belonging to the Postal Union.*

Papers for publication, and all other communications for the Editorial Department, should be sent to the Editor of the Boston Medical and Surgical Journal, 809 Paddock Building, 101 Tremont Street, Boston. All orders for reprints must be sent in writing to the Editor on or before the day of publication.

The Journal will furnish 100 reprints free, if requested in writing.

All letters containing business communications, or referring to the publication, subscription or advertising department of the Journal, should be addressed to the undersigned.

Remittances should be made by money order, draft or registered letter payable to

W. M. LEONARD,
101 TREMONT STREET, BOSTON, MASS.

PARAGEUSIA.

THE term parageusia was coined a few years ago, by Varden, to designate the complaint of bad taste when there is no material in the mouth to account for it. From time immemorial patients have called attention to bad tastes in their mouths, and it has always been customary to refer these exclusively to some condition of the gastro-intestinal tract, and particularly to stomach conditions. Naturally, some of them are unquestionably due to the latter, but it has lately been stated by a physician of extended observation that the larger the experience he has, the more is he inclined to discard in numerous instances a gastric origin for these bad tastes in the mouth. Many of them, he believes, are attributable to protein poisoning, and in support of this view may be cited the results of recent work at the Rockefeller Institute, which has shown that the amino-acids resulting from the breaking-up of proteins are primarily stored in the tissues; while the old idea, in support of which there has really never been any proof, was that the transmutation of peptones takes place in the walls of the intestine. It is possible that at the expiration of two or three hours after a protein meal some of these amino-acids may return to the mouth.

It would now appear that not only may a bad taste in the mouth be due to a great variety of affections other than conditions originating in the gastro-intestinal tract, but that in certain of these it may prove of positive diagnostic value. For this knowledge we are indebted to Dr. Thomas F. Reilly of New York, who in a paper read at the recent annual meeting of the American Therapeutic Society in Albany presented the results of a special study of the subject which he has been making during the past year. From this, Dr. Reilly is of the opinion that most physicians have so long been accustomed to associate a bad taste with digestive disorders that they have quite overlooked the fact that it may be an expression of various other diseased conditions. His attention was first directed to the matter about a year ago while he was engaged in studying a group of cases with high arterial tension. Associated with the latter he found this to be a constant symptom, and, since then, close questioning of all patients affected with high arterial tension and other evidences of nephritis has almost always revealed the presence of persistent bad taste in the mouth. In the early stages of chronic interstitial nephritis the patient had this symptom only on rising in the morning, resembling in this respect the suboccipital headache so characteristic of early nephritis. In the more advanced stages, however, it was present the greater part of the time, and, in general, the more continuous it was, the worse seemed to be the prognosis. In many instances this was the only symptom complained of, and he therefore suggests, as a working rule, that when a patient (particularly a person of forty-five or over) complains of persistent bad taste, a blood-pressure examination should be made at once. It is worthy of note that he often found this sign preceded the appearance of other symptoms by a month, or more, and he is convinced that in cardio-renal disease it is a diagnostic mark of distinct value. As to the treatment of the symptoms in this condition, in the cases associated with flatulence bromides proved more efficient than anything else, and in those without flatulence digitalis, either alone or in connection with hydrochloric acid, produced the best result. The nitrites and other vasomotors did not cause any improvement, but in a few instances diuretics of the diuretin type worked well.

Another affection in which he found this complaint of positive diagnostic value is gall-bladder disease, and its association with gall-stones and cholecystitis was next in frequency to its occurrence in connection with cardio-renal disease. Here the taste is usually a characteristic bitter

one, though in a few instances it was described as like that of musty eggs. This gall taste was practically always present in drainage operations of the gall-bladder, and it persisted as long as the bile drained. In several cases of catarrhal jaundice it was noted from three days to a week before the appearance of the jaundice. In some cases of pulmonary tuberculosis a bad taste comes on about noon and lasts the rest of the day, and in acute rheumatic fever a disordered taste, either acid or bitter, appears to be present in about 60% of the cases. In two cases of pernicious anemia a persistent bitter taste was found to have preceded the other clinical symptoms by six and eight months, respectively. Patients with arteriosclerosis sometimes complained of an inversion taste,—salty things tasting sweet, for instance. Anomalies of taste were also occasionally noted in disease of the central nervous system, and were believed to be often due to syphilis of the brain or cord. Among other conditions in which Reilly has found a complaint of bad taste are diabetes, hysteria, neurasthenia, pregnancy, gastric and duodenal ulcer, and cancer of the stomach and uterus. As the result of a year's close questioning of hundreds of patients, he concludes that persistent bad taste in the mouth is a symptom of much importance, that it is for the most part an expression of a serious toxemia, and that it may be of very great service in the early diagnosis of disease. In the two affections, interstitial nephritis and gall-bladder disease, when the sign is present it sometimes affords valuable information. As to the significance of its presence in other diseases, time will disclose, he says, whether or not it has any practical value.

EFFECTS OF THE WAR.

When the first news of the European War reached us the universal feeling was that a far-reaching calamity had overtaken us. Soon we shall realize that foreign books and instruments cannot longer be obtained, international medical congresses will be abandoned, the price of drugs, food supplies and automobiles will go up—they have done so already—and we shall be cut off from the recreation and profit gained by foreign travel and instruction at the great European medical centers.

The student of eugenics stands aghast at the set-back his cause has received. What is the use of studying declining birth-rates, the marriage of the unfit, and the many problems for race betterment when the chief nations of Europe are hard at work killing off their able-bodied men? The armies are picked men; all are in the flower of youth; there are no dwarfs, no cripples, no mental defectives, no old men. The better the soldiers fight the greater the mortality. The race in future must be propagated by those who are excluded by the physical recruiting tests and by those who escape death and the diseases of army life. Picture what our country might be today if those lusty scions of the early settlers of the land, cut off by cruel strife, had survived our Civil War. Could any more ingenious device be conceived to thwart the aims of practical eugenics than war, a carefully planned means of preventing the survival of the fittest?

In the days of the black death and extensive epidemics of contagious diseases the hand of the Lord was seen smiting his enemies; countless thousands of the Chinese were swept away annually because of unhygienic modes of living and inability to provide the necessities of life. Modern sanitation, preventive medicine and efficiency have worked extraordinary changes and the world has progressed through knowledge to a higher plane.

Although the Japanese in the Russo-Japanese war taught the army surgeon how to treat gunshot wounds in a really aseptic manner, and military medicine may gain something from the experiences of the present war, the field of battle is not the training place for the surgeon that it was in the time of Ambroise Paré. Recent discoveries have done away with, to a great extent, those great menaces to armies, typhoid fever and syphilis, and yellow fever and cholera are no longer prominent factors. The clever methods of destroying life represented by the rapid-fire gun, smokeless powder and the non-expanding bullet, dynamite bombs, the dirigible balloon and aeroplane, more than make up for the better results of surgery and improved sanitation. At the present moment Europe is in process of reverting to its status in the Middle Ages by means of the same chief agency in hampering progress employed at that time, namely, destructive warfare.

The Continent has lived through many lengthy wars and one era of Napoleon with its

shifting of boundaries and peoples, and it will probably survive the present disturbance. Let us trust that the United States may remain neutral, and may settle whatever differences arise by diplomatic means. We, who usher humanity into the world, who spend our lives repairing the broken frames and trying to prevent them from leaving this vale of tears, may well register a protest against legalized deliberate maiming and killing in this twentieth century.

AEROPLANE AMBULANCES.

THE present terrible European struggle, with the inevitable unprecedented number of wounded, makes a recent communication in the *London Lancet*[1] concerning the possibilities of the aeroplane as an ambulance, of peculiar interest.

The report states that recently aeroplanes were experimented with in this connection and surprising results obtained. The speed at which the wounded could be transported to the field base would, of course, be one of the greatest advantages of the method, and would in a measure offset the limited number that could be carried at a time.

At the military manoeuvers by the French army last year, the report goes on to say, aviators searched for the supposed wounded after a sham battle, with surprisingly good results, many wounded being found who would undoubtedly have remained undiscovered by other methods of search.

Mlle. Marvingt, a well known French woman aviator, has had a special machine built to accommodate, besides the aviator, a physician and a litter. The idea was given that this aeroplane ambulance might be useful in a European war, the writer little thinking how soon the ambulance might be actually tested in this connection. When the wounded are left lying at night, hidden from observation by slight changes in the elevation of the ground, this may prove to be a valuable way of finding them.

Landing and starting the machine would, of course, present many difficulties, but it will be soon found out in the present crisis, how much real value there may be in the idea. A fleet of Red Cross aeroplanes is entirely within the possibilities.

[1] July 4, 1914.

MEDICAL NOTES.

BUBONIC PLAGUE IN THE UNITED STATES.—The weekly report of the United States Public Health Service for Aug. 14, 1914, states that during the week ended July 4, 7 plague-infected squirrels were found in California and one at Seattle, Wash. Up to Aug. 14 there had been 15 human and 32 rodent cases of plague in New Orleans, La., since the outbreak of the epidemic at that city on June 27. Two new human cases were reported on Aug. 15, making a total of 17; and 20 more rodent cases, making a total of 52. It is believed that the infection was originally imported from Liverpool, where two deaths from plague have recently occurred.

INCIDENCE OF POLIOMYELITIS IN JUNE.—During the month of June, 1914, 10 cases of poliomyelitis were reported in Massachusetts, 8 in California, 6 in New York, 5 in Ohio, and 3 each in Minnesota and Mississippi.

HONOR FOR PRESIDENT ELIOT.—Dr. Charles W. Eliot, of Cambridge, Mass., has recently been elected a corresponding fellow of the British Academy.

MEMORIAL TO DR. WILSON.—A statue of Dr. Edward Adrian Wilson, who perished in the Antarctic with Captain Scott in March, 1912, has recently been unveiled at Cheltenham, England, Dr. Wilson's birthplace.

RABIES IN PITTSBURGH.—Report from Pittsburgh, Pa., states that rabies is at present epizoötic in that city, and that on July 29, eleven persons were bitten by rabid dogs.

LONDON DEATH-RATES IN JUNE.—Statistics recently published show that the death-rate of London for June, 1914, was only 12.6 per 1000 inhabitants living. Among the several districts and boroughs, the highest rate was 18.2 in Finsburg and Shoreditch, two crowded central and east end slums, and the lowest was 8.9 in Lewisham, a southern suburb.

FOSTER RADIUM CONSERVATION BILL.—Report from Washington, D. C., on Aug. 5 states that the Foster radium conservation bill will probably be brought up for early legislative consideration, owing to the shortage of radium occasioned by the European war, which has closed all the German radium manufacturing plants.

This bill aims to establish federal ownership of radium ore fields and operation of radium plants in the United States.

International Congress of Electrology.—The seventh biennial International Congress of Medical Electrology and Radiology was held from July 27 to 31 at Lyons, France, under the presidency of Prof. Renaut. Previous congresses have been held respectively at Paris, Berne, Milan, Amsterdam, Barcelona, and Prague.

BOSTON AND NEW ENGLAND.

Redistricting of Boston Milk Stations.—The Boston Milk and Baby Hygiene Association has recently announced a redistricting of its stations in the effort to secure closer and more efficient coöperation between them and the several Boston hospitals.

"Babies from milk stations in Roxbury and Dorchester will be sent by preference to the Infants' Hospital wards or the out-patient departments of the Children's Hospital; those from the North and West Ends and Charlestown will go to the Massachusetts General Hospital; those from the Lincoln House station will be sent to the Massachusetts Homeopathic Hospital; those from the South Bay Union station, Denison House station, South Boston and East Boston to the Boston Dispensary Hospital for Children or the children's out-patient department of the Boston Dispensary."

Boston's Lowest Death-Rate in July, 1914.—Boston's death-rate during July was the lowest ever recorded by the health department for any month. It was 12.48 and the number of deaths was 778. During the 33 years the records have been kept by the health department, this rate has never been equalled, and in July, 1881, with the population less than half the present population, the actual number of deaths was only 60 less than the number last month.

The deaths of children less than 1 year old during July was 139, which is also a record, the smallest number for any July in previous years being 163 in 1913. The highest death list of infants was 549, in July, 1896, and the July average for the period from 1881 to 1914 is 292.

Hospital Bequest.—The will of the late Charles W. Richardson, of Salem, Mass., which was filed recently in the Essex probate court contains a bequest of one-sixth of his residuary estate to the Salem Hospital.

The Cases of Infectious Diseases reported to the Boston Board of Health for the week ending Aug. 11, 1914, are as follows: Diphtheria, 44, of which 5 were non-residents; scarlatina, 8, of which 1 was non-resident; typhoid fever, 11; measles, 28, of which 6 were non-residents; tuberculosis, 54.

The death-rate for the week ending Aug. 11, 1914, was 13.89.

NEW YORK.

The Week's Death-Rate.—There were fewer deaths during the week ending August 1 than during the corresponding week of last year. There was in fact a saving of seventy-two lives. The death-rate for the first thirty-one weeks of 1914 was .33 lower than that for the corresponding period of 1913.

The most noteworthy feature last week was the decrease in the number of deaths from diarrheal diseases among infants, which is to be attributed in large measure to the cool weather that prevailed.

Bequest.—Among the charitable bequests in the will of the late Miss Cora Van Courtland Catlin of New York is one of $5,000 to the New York Post-Graduate Hospital, for the endowment of a bed in the children's ward in memory of the testator's father.

Current Literature

New York Medical Journal.

August 1, 1914.

1. Griffith, J. P. C. *Typhoid Fever in Early Life.*
2. Kolipinski, L. *Cardiac Headache.*
3. Morton, R. S. *Constitutional States in Relation to Gynecological Conditions.*
4. Applegate, J. C. *Four Unusual Obstetric Complications.*
5. Becker, H. C. *The Treatment of Scarlet Fever.*
6. *Leopold, S. S. *Eosinophilia in Chorea.*
7. Freundlich, D. B. *The Necessity for Coöperation of the Medical Profession in the Successful Treatment of Pyorrhea Alveolaris.*
8. May, C. H. *A New Electric Ophthalmoscope.*

6. Leopold studied the blood in eighteen cases of Sydenham's chorea. His results indicate that eosinophilia is present in the majority of cases of this disease. It is almost invariably present in recurring cases, especially where there has been more than a single recurrence. The absence of eosinophilia was noted in every case where the diagnosis of true chorea was in doubt. The presence of eosinophilia in the majority of cases is in favor of the theory of the infective origin of chorea rather than the theory that it is a functional neurosis. [L. D. C.]

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

AUGUST 1, 1914.

1. VAUGHN, J. C. *Parenteral Protein Digestion.*
2. *ECHOLIS, C. M. *Limitations of the Dialysis Method as a Practical Test for Pregnancy.*
3. *SCHWARZ, H. *Value of Abderhalden's Biologic Reactions to the Obstetrician and Gynecologist.*
4. *BEST, W. H. *The Use of Salvarsan in Non-syphilitic Diseases.*
5. *FRIEDMAN, J. C., AND HAMBURGER, W. W. *Experimental Chronic Gastric Ulcer. A Second Contribution to the Experimental Pathology of the Stomach.*
6. JESSUP, D. S. D. *Adenomyoma of the Recto-vaginal Septum.*
7. *RAVOGLI, A. *A Few Practical Points on the Treatment of Leg Ulcers.*
8. DARNALL, W. S. *Pelvic Varicocele.*
9. HIATT, H. B., AND EILLAN, W. *Notes on Cases of Sprue Invalided from the Tropics. Will It Become Endemic Here?*
10. MCKIM, N. *The Blood in Acidosis from the Quantitative Point of View.*
11. KNOWLES, F. C., AND FRESCOLA, L. D. *Diphtheria of the Skin of Unusual Types. Report of Two Cases.*
12. WILLIAMS, E. M. *Lead Poisoning with Paralysis of the External Ocular Muscles.*
13. SMITH, W. H., AND KIRK, N. T. *Foreign Body in the Sub-maxillary Gland.*

2. Echolis believes that the dialysis test for pregnancy in its present stage of development is chiefly of value in a negative sense. That is, if a woman fails to give a positive reaction she is not pregnant. If, on the other hand, she gives a positive reaction one can only say she is probably pregnant, for 10 to 15% of non-pregnant persons give positive reactions.

3. Schwarz finds that this test is very complicated and often unreliable because of the difficulty in mastering the technic. He advises more effort to simplify the methods now in use.

4. Best finds from large clinical evidence that salvarsan is specific in any disease caused by any variety of spirillum. It has curative properties in those diseases in which the infecting organisms are found in the blood or lymph. It is of great value in conditions in which arsenic has been successfully used, and if used long enough, often in those diseases in which arsenic has been unsuccessful.

5. These authors have a very practical and valuable article on the experimental production of gastric ulcer.

7. Ravogli's article is of very practical interest and value. [E. H. R]

THE ARCHIVES OF INTERNAL MEDICINE.

JULY, 1914.

1. *DAVIS, D. J. *An Acid-fast Streptothrix.*
2. *ASH, J. E. *The Blood in Inanition.*
3. WIGGERS, C. J. *The Pathologic Physiology of the Circulation During Hemorrhage.*
4. *NEWBURGH, L. H., AND MINOT, G. R. *The Blood-Pressure in Pneumonia.*
5. *COLE, R. *Pneumococcus Infection and Lobar Pneumonia.*
6. MEYER, E. *The Color-Index of the Red Blood Corpuscles.*
7. *CLAYPOLE, E. J. *Human Streptotrichosis and Its Differentiation from Tuberculosis.*
8. *ARCHIBALD, R. A., AND MOORE, G. A. *Preliminary Report on the Production, Action, and Therapeutic Effects of Leucocytic Extracts.*
9. FITZ, R. *A Comparison of Rang's Micro-method for Determining Blood Sugar with Bertrand's Method.*

1. Davis reports a case of pulmonary infection probably caused by an acid-fast branching mycelial growth. These cases clinically are not usually distinguished from pulmonary tuberculosis. Potassium iodide in large doses constitutes the treatment for such cases.

2. Ash studied the blood of a man who fasted for thirty-one days. He found that there was a slight actual loss in hemoglobin, more marked during the second ten days. There were moderate fluctuations in water content, particularly during the first half of the fasting period. There was a decided rise in polynuclear neutrophiles in the early days. There was an increase in coagulability, especially after the first two weeks. The blood as a whole was distinctly resistant to the effects of uncomplicated inanition, permitting of entire abstinence from food for the thirty-one days without deleterious consequences, as far as the blood was concerned.

4. Newburgh and Minot studied the blood-pressure in fifteen cases of lobar pneumonia at the Massachusetts General Hospital. Their results are not in accord with some of the newer ideas upon which considerable stress has been laid. According to their observations there is not a failure of the vasomotor center in pneumonia. A low systolic pressure is not necessarily of evil omen; in fact, the systolic pressure in the writer's fatal cases tended to be higher than in the recoveries. Blood-pressure measurements, therefore, they say, cannot be used as a basis for treatment in pneumonia. The writers tested the value of Gibson's rule that when arterial pressure, expressed in millimeters of mercury, does not fall below the pulse-rate, expressed in beats per minute, the prognosis is good. In their series of cases they found this rule wrong more often than right. The rate of the pulse and not the level of the pressure is the chief factor in deciding whether the pressure will fall above or below the pulse.

5. Cole discusses the theory and the present status of the serum treatment of pneumococcus pneumonia. The outcome of a case, he says, depends upon the virulence of the organisms concerned and upon the ability of the body, first to limit the local infection, and second to prevent the invasion of the blood by the organisms. Leucocytes play a part in the resistance to the local spread and probably also to the general infection. The most important part in prevention of general infection is probably played by immune substances contained in the blood serum. Pneumococci differ in their immunological reactions and for effective treatment it is necessary to use serum immune to the group of organisms to which the special organism causing the infection belongs. The writer has produced immune sera effective against two of the most important groups of pneumococci, and has used them on a limited number of cases of pneumonia with promising results.

7. Claypole discusses streptotrichosis and its differentiation from other infections, especially tuberculosis. Streptotrichins (glycerinated bouillon cultures, concentrated), made from the non-acid-fast mycelial and partly acid-fast bacillary organisms, give definite skin reactions on persons with frank infections, but do not show on controls (including cases of recognized tuberculosis). Gland and bone-infections with streptotriches may be demonstrated by skin reactions, too. Streptotrichosis and tuberculosis may exist in the same person at the same time, as evidenced by the appearance of both organisms in the sputum and both skin reactions.

8. Archibald and Moore report on an experimental study undertaken with the purpose of obtaining leucocytic substances in quantities that would render them therapeutically practical and commercially possible. They were able to obtain these substances in such quantities directly from the blood of normal guinea-pigs. They found that the parenteral injection of leucocytic substances caused profound changes in the blood, producing a marked leucocytosis and marked changes in the individual leucocytes.

THE INDIAN MEDICAL GAZETTE.

JULY, 1914.

1. *WALL, F. *Fatal Case of Ophitoxemia.*
2. TUKE, A. W. *Cocaine Eaters of Bombay.*
3. CONNOR, F. P. *Plague Jottings.*
4. SHORTEN, J. A. *Osseous New Growths at the Elbow Joint Following Injuries.*
5. DOWDEN, R. *Three Cases Illustrating Unusual Sequelae of Malarial Fever.*
6. HANCE, T. B. *The Treatment of Uncomplicated Retroversion of the Uterus by the Sling Operation.*
7. SCOTT, L. B. *The Nature of Jail Dysentery.*
8. RENAULT. *Notes on the Treatment of Cholera by the Exhibition of Chlorhydrate of Emetine in Hypodermic Injections.*
9. CHATTERJEE, G. C. *A Case of Pulmonary Tuberculosis Treated with Tuberculin.*
10. *DARNVALA, B. P. *Two Cases of Transposition of the Viscera.*

1. Wall reports a case of death in ten hours from the bite of the common Indian krait (Bungarus caeruleus) with symptoms of fulminating toxemia typical of Colubrine poisoning. He has seen only two other fatal cases.

10. Darnvala reports two cases of complete situs transversus viscerum, and believes that anatomic anomaly to be more frequent than is commonly supposed. [R. M. G.]

MÜNCHENER MEDIZINISCHE WOCHENSCHRIFT.

No. 28. JULY 14, 1914.

1. BAUMGARTEN, P. *The Relation of Lymphogranuloma to Tuberculosis.*
2. *KRUSE, W. *The Cause of Coughs and Colds.*
3. MARCHAND, A. *Living Adult Monstra Duplicia.*
4. *NIKITIN, M. *The Influence of Protective Inoculations against Rabies in Cases of Epilepsy.*
5. v. DOMARUS, A., AND BARSIECK, W. *The Question of Protective Ferments.*
6. STROMEYER, K. *The Magnesium Treatment of Tetanus.*
7. SCHMID, M. *Results with Lipojodin-Ciba.*
8. WEISS, H. *A Case of Tuberculosis of the Bladder Cured by Lecutyl (Copper Lecithin).*
9. MASAREY, A. *Adalin in the Altitudes and Tropics.*
10. STÜMPKE, G. *Gonorrheal Granulations.*
11. v. MALAISÉ. *The Diagnosis of Brain Tumor.*
12. STRAUSS, H. *Intravenous Injections.*
13. KAUFMANN, K. *The Production of Artificial Pneumothorax.*
14. PFEIFFER, H. *Peptolytic Ferments in Blood.*
15. v. STUBENRAUCH, L. *Arthritis Deformans in the Light of Recent Studies. (Conclusion.)*
16. DÜRCK, H. *Dr. Gaspar Vianna.*
17. LENZ, F. *Resolutions on the Question of Births by the German Society for Race Hygiene.*

2. The cause of head colds has been attributed to a variety of micro-organisms. Recently Kruse obtained from the nasal secretion of one of his assistants a filterable virus. In four out of twelve individuals inoculated intranasally with this virus characteristic symptoms of head cold developed in from one to three days. In a later experiment thirty-six students were inoculated in similar fashion, and fifteen developed the disease, while of thirty-six who were not inoculated only one became infected. Kruse thinks from these observations that a certain percentage of ordinary colds are due to such a filterable virus and suggests further studies in regard to its nature and specificity.

4. In 1891, Nikitin saw a typical case of epilepsy which was given Pasteur treatment on account of a bite received from a rabid dog. Following this, except for one epileptic attack shortly after the treatment was begun, the patient has been well. This observation led Nikitin to make two series of studies. In the first, eight epileptic patients were injected for sixteen days with subcutaneous injections of an emulsion of normal rabbit spinal cord given daily. The patients were followed for a month. In no case was any benefit noted. In the second series of cases, epileptics were injected with a spinal cord emulsion from infected animals as in the preventive treatment of rabies. Nikitin found that this emulsion had a very beneficial effect on more than half of his patients. The epileptic fits diminished after a variable period of latency and gradually becames less and less frequent. Whether a cure of the disease can be accomplished by this treatment cannot be stated. The first case recorded, however, suggests that this is possible. [R. F.]

No. 29. JULY 21, 1914.

1. BUMM, E., AND WARNEKROS, K. *Cure of Deep-Lying Carcinoma by X-ray Treatment.*
2. *v. PIRQUET, C. *The Graphic Analysis of Cutaneous Reactions.*
3. WEYGANDT, W., JAKOB, A., AND HAFKA, K. *Clinical and Experimental Studies with the Injection of Salvarsan into the Central Nervous System.*
4. BAISCH, B. *The Treatment of Surgical Tuberculosis with Enzytol.*
5. HOTZ. *Continuous Anesthesia.*
6. WEINBERG, M. *Abderhalden's Dialysis Method in the Diagnosis and Differential Diagnosis of Malignant Tumors.*
7. FAUSER, A. *"Passive" Transference of Ferments from Psychopathic Patients to Rabbits.*
8. HOLZBACH, E. *Continuous Irrigation of the Bladder and Pelvis of the Kidney.*
8. SCHUTZ, R. *Chronic Gastro-intestinal Dyspepsia, Colitis, and Cirrhosis of the Liver.*
9. DRACHTER, R. *Hare-lip and Its Operative Treatment.*
10. STÜMPKE, G. *Thigan.*
11. BERNEKER, O. *A New Arrangement for the Freezing of Circumscribed Skin Areas with Ethyl Chloride.*
12. MICHAEL, O. *A Box for Sterile Gauze.*
13. SCHINDLER, H. *Treatment of Post-partum Prolapse without Operation.*
14. MORO. *The Moro-Doganoff Reaction.*
15. HEGER, P. *Hugo Kronecker.*

2. von Pirquet describes a method for the graphic reproduction and analysis of intracutaneous tuberculin reactions. He measures the skin area involved at stated intervals after injection, and by an empirical scale the degree of redness, swelling or exudation. In this manner, he is able to plot three characteristic curves in a given test. The first is due to trauma, the second is due to the reaction to bouillon which he uses as a vehicle, and the third is due to the allergic reaction. The method is, therefore, more quantitative than the customary visual method of recording skin tests.

5. Hotz reports on a few surgical cases treated with "Anesthesin." This is a powder, whose components are not mentioned, manufactured by the firm of Höchst. "Anesthesin" is designed to act as a local anesthetic for a considerable interval of time, and thus to prevent post-operative pain and tenderness, and to remove causes for shock. In abdominal section before the sutures are placed, a small amount of "anesthesin" is powdered into the wound, which is then closed according to ordinary technic. Hotz has used "anesthesin" in only a few cases. Sepsis did not occur. Post-operative pain was diminished notably, so that the patients were able to move without discomfort and suffered little bodily and mental reaction to the operation. On the whole, Holtz concludes that "anesthesin" may prove of considerable value in post-operative treatment. [R. F.]

DEUTSCHES ARCHIV FÜR KLINISCHE MEDIZIN.

BAND 115. HEFT 5 AND 6. JUNE 26, 1914.

1. *TOBIESEN, F. *The Composition of Pneumothorax Air.*
2. MALIWA, E. *Work on the Chemistry of Sputum.—Ferments of Sputum.*
3. ACHELIS, W. *Adhesive Pericarditis and the Disappearance of the Vertical Dislocation of the Heart on Change from the Horizontal to the Upright Position, as Occurs Normally.*
4. *LANDSBERG, M. *The Question of Sugar Combustion in Pancreatic Diabetes.*
5. EICHHORST, H. *Latent Meningeal Cancer.*
6. ZADEK, J. *Disturbances Following Pneumonia.*
7. STRAUB, H. *Dynamics of the Mammalian Heart.*
8. WACK, P. *Leucocytic Count in Miliary Tuberculosis and Its Diagnostic Importance.*
9. SEMERAN, M. *A Study on Pulsus Paradoxus.*
10. SCHULTZ, W. *Treatment of Scarlatina with Human Serum and Lipoid Serum.*

1. Tobiesen has studied the chemical content of air introduced into the pleural cavity. If nitrogen, oxygen, carbonic acid gas, or mixtures of them, are introduced into the pleural cavity, they change their relations somewhat by diffusion into the tissues so that they exist in a ratio of 90% nitrogen, 4% oxygen and 6% CO_2. If now an exudate of beginning pleurisy appears the oxygen will disappear and will do so before it is possible in other ways to demonstrate an exudate. The disappearance of oxygen may thus be of diagnostic value.

4. Landsberg takes up the different possibilities of glycosuria in the human and also the two theories of Minkowski and v. Noorden in regard to diabetes. The former looks upon the disease as an inability of the tissues to take care of sugar and a subsequent overproduction of sugar on the part of the liver. This inability depends upon the failure of a hormone from the pancreas, which normally stimulates the body tissues to burn the sugar. v. Noorden, on the other hand, thinks the primary trouble is an inability of the liver to turn the sugar into glycogen, due to the failure of some hormone from the pancreas. The author then takes up a review of the literature in support of the different points of view. He then reports on a series of experiments he has conducted upon dogs in order to see the activity of the blood cells in the breaking up of sugars. In his animals he produced diabetes by extirpation of the pancreas. From his work he finds no proof of even a diminution of the ability to burn up sugar in a diabetic organism. Blood cells from his dogs destroyed as much sugar as cells from normal animals. Normal blood cells in serum from diabetic dogs used as much sugar as similar cells in normal dogs' serum. The sugar burnt up in working muscle of pancreatic diabetic dogs corresponds practically with that used in normal working animals' muscle. This work speaks against the view that a pancreatic hormone is necessary for the burning of sugar by the body cells. [C. F., JR.]

ANNALES DE L'INSTITUT PASTEUR.

VOL. XXVIII. NO. 5. MAY, 1914.

1. TSIKLINSKY, MLLE. *The Intestinal Flora of Mice.*
2. BERNARD, S. N., AND BANCHE, J. *Influence of Mode of Penetration by Skin or Mouth of the Stephanurus Dentatus upon the Localization of This Hematode in the Pig and upon Its Evolution.*
3. WEINBERG, M., AND SEGUIN, P. *Biological Researches upon Eosinophiles.*
4. LEVADITI, C., AND PIGRIOT, J. *Phagocytosis of Neurons in Poliomyelitis.*
5. LANNOY, L., AND BOUHL, M. L. *The Blood of the Fowl in Experimental Spirillum Infection.*
6. *BOINET, E. *Vaccine Treatment in Typhoid Fever.*
7. RAPHAEL, A. *Note upon the Bacillus Perfringens.*

6. In this part of his article on treatment of typhoid fever, which is to be continued in a later number, Professor Boinet takes up a discussion of some 25 cases. He has used the sensitized vaccine of Besredka. He emphasizes especially the persistence of the vitality of the typhoid bacilli in this vaccine. This feature allows one to hope for an immunization more active and rapid and the formation of a greater number of antibodies. It also produces a more marked bactericidal power in the blood. He employs from three to six subcutaneous injections of not more than eleven cubic centimeters, and has seen no accidents from the inoculations. He emphasizes the importance of a positive Widal reaction or blood culture to confirm the diagnosis before treatment, as it is detrimental to the patient in tuberculosis. He considers that this form of treatment augments the number of antibodies and bactericidal power of the serum. There next follows the report of the 25 cases. Twenty-one of these cases acted favorably, and in part, he thinks, due to the action of the vaccine. In the four cases that died he considers the vaccine either did not have a fair chance or else the cases died of typhoid accidents, such as hemorrhage or perforation. [C. F., JR.]

VOL. XXVIII. NO. 6. JUNE, 1914.

1. *BESREDKA, A., AND MANOUKHINE, J. *Reaction of Fixation in the Tubercular.*
2. BESREDKA, A., AND JUPILLE, F. *Egg Gelatin Culture Media.*
3. MANOUELIAN, D. *Investigation of the Cardiac Plexus and Innervation of the Aorta.*
4. MANOUELIAN, Y. *In Regard to the New Theory about the Pathogenesis of Angina Pectoris.*
5. MANOUELIAN, Y. *Remarks Concerning the Existence of Nerve Centres in Organs.*
6. RAMON, G. *Studies upon the Bacillus of Malasse and Vignal, the Pseudo Bacillus of the Guinea-Pig, Experimentally and in the Natural Course of the Disease.*
7. *BOINET, E. *Vaccine Therapy in Typhoid Fever. (Second part.)*
8. ALIKAISE, E. *Studies upon Ricine—Hypersensitiveness to Ricine.*
9. CHAUSSÉ, P. *Conditions of Saliva and Tubercular Sputum Powdered by Air Currents, and the Bacterial Content.*
10. MORAX, V., AND BOLLACK, J. *Experimental Studies upon Anaphylactic Reaction Produced by the Albuminoid Cristallin.*
11. RONJENTZOFF, D. *Intestinal Flora of Rabbits Fed on Carrots and Others Subjected to Starvation.*

1. These authors tried out the test for deviation of the complement in tuberculosis experimentally and on human beings. They find that the guinea-pigs and human cases react pretty much the same way. The test can be used diagnostically and to a certain degree prognostically in tuberculosis. In early cases the fixation is always present, in older cases usually so and in late cases the reaction only partial or negative. In the negative cases death usually soon follows.

7. Boinet in this number of the journal adds 28 more cases to his list of patients with typhoid fever who have been treated with the sensitized virus of Besredka. From this series he is more impressed than ever with the value of this form of treatment, both from the point of view of cure and the chance of hastening the recovery. His figures in his two series certainly compare favorably with the figures for the cases in the hospital at the same time in the preceding year. He again emphasizes the importance of not using the vaccine in very severe cases. [C. F., JR.]

Il Policlinico.

June, 1914.

MEDICAL SECTION.

1. Fragnito, O. *Tumor of the Right Frontal Lobe with Cerebellar Symptoms.*
2. Bianchi, E. *Experimental and Clinical Studies on the Basophilia of the Red Corpuscles.*
3. Vidoni, G. *The "Fore-arm Sign" in Mental Diseases.*

SURGICAL SECTION.

1. Beccherle, G. *A Case of Extrapelvic Tumor of the Round Ligament.*
2. Fioravanti, L. *My Method of Tendinous Plastic in Two Cases of Grave Traumatic Lesions.*
3. *Dialti, G. *Hematuria from Vesical Varices.*
4. Azara, P. *The Various Grades of Detachment of the Mesentery in Relation to the Vitality and Function of the Intestine. (To be continued.)*

3. Continuing and concluding his work on vesical varices, Dialti classifies them as, (1) idiopathic, (2) associated with pregnancy and gynecologic affections, (3) prostatic, and (4) associated with local and general maladies. There is a copious bibliography. [R. M. G.]

Miscellany.

FOREIGN BIRTH-RATES AND THE EUROPEAN WAR.

The Paris correspondent of the *Journal* of *the American Medical Association* has recently communicated the following additional data about the constantly diminishing birth-rate, and other important vital statistics of France:—

"There were 745,539 living infants born in France in 1913 as contrasted with 750,651 in 1912. No lower total has ever been registered, with the exception of the year 1911. In recalling the steady fall in the French birth-rate, it will be enough to mention that the annual average of living births was 945,000 during the period from 1872 to 1875; that, since 1907, the number of births dropped below 800,000, and since 1911, below 750,000. This means that in less than forty years the French births have diminished by more than 200,000 a year. The proportion of living children to every ten thousand inhabitants was 188 in 1913, instead of 190 in 1912, 187 in 1911, 196 in 1910, and 205 in 1906. The decrease, therefore, is accentuated each year. It is true that the birth-rate is falling in all the large countries of Europe, but the proportion is much less than in France; and, moreover, the excess of births over deaths is proportionately five or six times greater. Thus, for the year 1912, the excess of births over deaths for each ten thousand inhabitants was only 15 in France; in the same year it was 158 in Holland, 140 in Italy, 130 in Hungary, 127 in Germany, 107 in Austria, and 105 in England. Last year showed an excess of 41,901 births over deaths, or only 10 for each ten thousand. The excess in 1912 was 57,911, or 15 per ten thousand. This diminution is due to a deficit of 5,112 births and an increase of 10,989 deaths. The departments in which the birth-rate exceeds the death-rate are those of the north, Pas-de-Calais, Brittany, the frontier regions of the northeast, Limousin and Corsica. On the other hand, the valley of the Garonne, Normandy, the plateau region of Langres and Dauphiny continue to lose ground. The number of deaths (703,638) is greater by 11,000 than that of 1912, which was lower than any recorded number since the opening of the nineteenth century. The proportion of deaths to the population is 178:10,000, as against 172 in 1912, 196 in 1911, and 179 in 1910. The mortality has increased in 64 departments, and particularly in Bouches-du-Rhône, Dordogne, Var, Haute-Savoie, Corsica, Somme, Haute-Vienne, l'Aveyron and Tarn-et-Garonne. In 1913, 298,760 marriages were recorded, or 13,169 less than in the preceding year. The proportion of the newly married for each ten thousand has dropped from 158 in 1912 to 151 in 1913. The number of divorces has increased by about 500; 15,706 were recorded in place of 14,579 in 1912. The increase has therefore continued; in 1900 there were but 7,157 divorces; in thirteen years the number has more than doubled."

These statistics, always of interest for speculation, acquire new significance in the light of the great European war now in progress. If it be true that this war is at bottom racial, another step in the great medieval barbaric invasion of South European civilization by hordes of superior vitality from the north, then the outcome of the conflict, whichever way it may befall, should go far toward solving the question whether decreasing race fertility is or is not an accurate index of declining race vigor.

On Aug. 7 the Berlin correspondent of the Boston *Transcript* communicated still further data of interest in connection with the German birth-rate and population:—

"The imperial statistical department gives the population of the German Empire, for the middle of the year 1914 as 67,812,000. In the middle of last year it amounted to 67,000,000 in round numbers, and it is assumed that in the meantime it has increased to the amount of 800,000. Of course this is merely an estimate. But the statistical department is extremely careful in such calculations, so that the figures may be regarded as likely to be extremely accurate. As the population of France has increased by only 42,000 persons in the course of the last year, the natural increase of population in Germany would amount in the same period to nearly twenty times that of France.

"At the same time, it must be borne in mind that there has also been a falling off in the birth-rate of Germany of late years. For whereas in the year 1906, 2,085,000 children were born in Germany, in the year 1910 the total amounted to

only 1,983,000, that is to say, to over 100,000 less, and in the year 1912, the total amounted to only 1,926,000, that is to say nearly 80,000 less. This decrease in the births is, however, almost equalized by a nearly equal decrease in the death-rate. In the year 1905, 1,256,000 persons died in Germany, whereas in the year 1912 the total deaths amounted to 1,086,000; so that the falling off in the death-rate amounts to 170,000, the result being that this falling off is only 10,000 less than the decrease of births since 1908.

"Then we have the fact that there has been no falling off in the number of marriages in Germany during the last few years. The number recorded for the year 1909 was 494,000, and that for 1912 523,000. We see, therefore, that the number of marriages has increased by nearly 30,000, whereas in France the number has lessened almost to the same extent. This all points to the fact that, in contradiction to France, there is not likely to be any material falling off in the German birth-rate in the immediate future. Furthermore, the continued hygienic improvements being introduced into Germany, more especially all that is being done to fight against infant mortality, render it extremely unlikely that any increase of the death-rate should take place, of course, barring all unexpected events, such as epidemics or a war.

"It is extremely difficult to reconcile this steady fall in the French birth-rate with the continued increase of the peace strength of the army. An eminent authority, the French General Pédeya, has expressed his opinion that the reintroduction of a period of three years' military service will place an unnatural strain on the resources of the country. He points out that Austria-Hungary, with a population of ten million more, possesses a much smaller standing army. Another authority, Troussant, the inspecting medical officer of the French army, states that the health of the French troops is in a very unsatisfactory condition. An appalling percentage of the young men serving with the colors are tuberculous. It will readily be believed that the great physical strain to which the modern soldier is subjected, even in times of peace, is hardly likely to have a beneficial effect on such men. It is obvious that a country having a population of forty million inhabitants and increasing at the rate of only 40,000 annually, can keep the same number of men with the colors as a country of sixty-eight million inhabitants, and with an annual increase of more than 800,000, only provided that it is prepared to accept a far lower physical standard for its recruits, that is to say, such a country must take the recruits as they come, and be prepared to see a large percentage of them physically ruined by the strain thus imposed."

It is probably true that the Germans have already, especially in the larger cities, begun to feel and show the debilitating and deteriorative effects of modern civilization. The question therefore remains whether this effect is yet sufficient to make them unable to cope, on the one hand, with highly civilized nations with a low birth-rate, like France and England, and on the other with the perhaps still sturdier and more prolific stock of the more barbaric Muscovite and other Slavic peoples of Russia and the Balkan countries.

AMERICAN RED CROSS HOSPITAL AND NURSING PROVISIONS FOR THE EUROPEAN WAR.

THE outbreak of hostilities in the great European war was followed almost immediately by extensive arrangements on the part of all nations to provide adequate field and base hospital accommodations and nursing to care for the large numbers of wounded which may be expected. Not only the countries involved in the contest, but neutral nations as well, especially the United States, have made preparations to furnish many volunteers for this work.

On Aug. 5 Mr. Robert Lansing, counsellor of the United States department of state, as chairman of the international board of the American Red Cross, called a joint meeting of that body and of the Red Cross war relief board, of which General Gorgas is chairman, in the latter's office at the war department to consider ways and means of extending aid to the combatants.

"The meeting today was attended by Maj.-Gen. William C. Gorgas, surgeon-general U.S.A., chairman of the Red Cross war relief board, presiding; Miss Mabel T. Boardman, chairman of the national relief board of the Red Cross, and a member of the international relief board; Surg.-Gen. Braisted of the navy; Ernest P. Bicknell, national director of Red Cross; Maj. R. U. Patterson, chief of the Red Cross first aid department; Surg. J. R. Holcom, U.S.N.; Miss Jane A. Delano, chief of the Red Cross general nursing service, and Mrs. Lena S. Higbee, superintendent of the navy nursing corps, all members of the war relief board, and Bernard N. Baker of Baltimore and Director-General John Barrett of the Pan-American Union, members of the international relief board."

At this meeting it was voted to charter and equip an American Red Cross relief ship to carry hospital units to points nearest the various scenes of action. Each unit will consist of 3 physicians and 12 nurses. It is said that 5000 American Red Cross nurses have already volunteered for this service.

It was also voted at the joint meeting to issue the following official appeal for money contributions and support of the work.

"During our war with Spain thousands of dollars were sent by the European Red Cross

societies to the American Red Cross to aid in the care of our sick and wounded soldiers. Now in the hour of their supreme need the American Red Cross, both for the sake of humanity and to express our gratitude for their aid to us in the time of trouble and distress, has decided to charter a ship and send to each country involved nurses and hospital supplies.

"This ship, sailing under the Red Cross flag, will be under the protection of the treaties of Geneva and The Hague and can enter any harbor for the discharge of its beneficent duty. In no other way can this trained personnel so greatly needed reach the different countries. Protection is provided also for the personnel of the Red Cross societies of neutral States that render aid by the treaty of Geneva.

"The American Red Cross appeals most earnestly to all of our people, to the governors of states as presidents of the Red Cross state boards, to the Red Cross chapters, to mayors of cities, to chambers of commerce, to boards of trade and to all associations and individuals for contributions to carry on this work. Contributions may be designated by the donors, if they so desire, for the aid of any special country and will be used for the country designated, but assistance will be given to all in the true spirit of the Red Cross represented by its motto, 'Neutrality-Humanity.'

"Grieved as we may be over this terrible war, the agonizing cry of suffering men cannot appeal to us in vain. The American Red Cross asks for a prompt and generous response. Contributions may be sent to the American Red Cross, Washington, D. C., or to state and local treasurers of the Red Cross."

The following committees were appointed to take charge of special details of the enterprise.

To charter a suitable vessel—Surgeon General William Braisted, U. S. N.; Chief Constructor Watt, U. S. N., and Bernard M. Baker of Baltimore.

On personnel and hospital units—Surgeon-General Braisted, Major R. Patterson, Medical Corps, U. S. A., chief of Red Cross first aid department.

Designation of nurses—Miss Jane A. Delano, chairman of the American Red Cross general nursing service, numbering 5000 graduate nurses.

The American Red Cross relief ship will be adequately designated as such and will convey hospital units assigned to the several countries engaged in war as circumstances may direct.

"In order that the identity of the American Red Cross relief ship will be certain, it will be painted white, with a red band encircling the hull. A red cross will be painted on the smokestack, and it will fly Red Cross flags. At the time a particular country is receiving assistance the flag of that country, in addition to the Red Cross flag, will be flown."

The first acceptance of this offer of aid came on Aug. 6 from The Hague, stating that hospital units will be despatched thence as quickly as transportation can be obtained.

The women of Canada have also offered to provide a hospital ship for the British navy, and on Aug. 9 this offer was accepted by the admiralty at London. On Aug. 10 the former Empress Eugénie sent a subscription of 5000 francs for the British Red Cross. On Aug. 11, report from Rotterdam stated that the Dutch-American Steamship Line had placed its piers on the Hook of Holland at the disposal of the Dutch Red Cross. On the same day it was reported that Kaiser Wilhelm has given the sum of 400,000 marks to the German Red Cross.

On Aug. 12, it was announced from Washington, D.C., that Rear Admiral Aaron Ward, U. S. N., retired, has accepted the command of the American Red Cross hospital ship.

PROSPECT OF CASUALTIES IN THE EUROPEAN WAR.

THERE is an almost prophetic note in a volume[1] recently published in Paris by Dr. Octave Laurent, of Brussels, on the surgical aspects of the recent Balkan wars between Bulgaria and Turkey.

"Bulgaria put into the field during the two wars more than 500,000 soldiers, drawn from a population of about 4,300,000. In the first war 30,000 men were killed and about 53,000 were wounded. In the second war the killed numbered 16,000, and the wounded about 62,000. The totals for the two wars were: Killed, 46,000; wounded, 115,000. The total of killed and wounded, 161,000, represented one-third of the effective force of the whole army, or three per cent. of the entire population of the country. The deaths were one in twelve of the whole army, one in four of the wounded, and one in a hundred of the population. During the month of July, 1913, 150,000 men were killed or wounded on both sides; and more than half of these, at least 80,000, fell on the banks of the Bregalnitsa during the six days from June 30 to July 5.

" 'If you put a zero behind each of these numbers you will have some idea of the effective strength of the armies and the losses that must be presumed to take place in any war which would tomorrow set the armed forces of any two first-class powers of Europe on the fighting line before each other. There would be not less than 1,500,000 dead and wounded in the course of the first month.'

"The high proportion of the killed to the wounded during the Balkan War is a modern feature that would be likely to be repeated. Artillery fire, meaning by that the use of explosive shrapnel, was responsible for more than half

[1] Commented upon by Mr. Benjamin Baker in the *Boston Transcript*.

of the deaths, but for less than one-fifth of the wounded. Rifle fire was therefore relatively ineffective by its failure to produce those massive destructive effects which follow so swiftly on the skilful use of artillery. It is precisely the reliance on the large use of artillery fire which would mark the operations of the great European armies, and from that one has little excuse for forecasting any but high figures for the killed.

"Under modern conditions, many of those wounded by the small calibre, high velocity bullets now used would stand good chances of recovery with probable small permanent disablement. One of the surprising features of the wounds in the Balkan War was the great number of perforations by bullets which did comparatively little permanent damage. In some of these seemingly serious cases of wounds, healing was rapid and uneventful. Even bones were sometimes neatly pierced with small holes, without fracture, or other serious consequences. This was not the rule in bone injuries, however, for there were many complicated fractures of the larger bones, these constituting a special surgical problem. Flesh wounds from direct rifle fire were often absolutely harmless; and in many cases the wounded were back on the firing line in two or three weeks after wounds that in the older wars would have meant absolute disablement. The mortality was distributed among fifty-five per cent. wounds of the head; thirty-five to forty per cent. wounds of the trunk; and five per cent. wounds of the limbs. Amputations were done in less than one per cent. of all the cases treated in the hospitals.

"In modern warfare, where the soldier fires under cover as much as possible, lying prone in a trench, bullets from the enemy either hit him on the head or catch his hands. The right hand is protected by the rifle, so that it is the left that gets hurt.

"Laurent suggests the use of a metallic shield, sufficiently light, yet resistant, to protect the head, another fixed to the left hand or on the rifle itself, and a third to protect the region of the heart. Many soliders have had their lives saved by the chance presence of a pocket-book filled with papers, or even of a metallic cigarette-case, in the left breast-pocket of their tunic. Superposed sheets of paper have always constituted, even in ancient wars, an excellent shield.

"Laurent's statistics show from 82 to 84 per cent. of bullet wounds, from 15 to 17 per cent. of shrapnel wounds, and 1 per cent. of wounds by cold steel. Infection by the projectile was observed in 40 per cent. of cases by shrapnel and from 10 to 28 per cent. of bullet wounds.

"The number of wounds cured without any complication was 75 per cent. Shrapnel bullets have a much less penetrative force than rifle bullets, at any rate when the shrapnel does not burst close to the soldier."

Correspondence.

WARNING.

BOSTON, Aug. 14, 1914.

Mr. Editor: A man who says he is the agent of the Alaska Fur Company sold me furs the other day which he said were lynx. An established furrier afterwards said that the furs were rabbit and were worth three-fifths of what I paid for them.

Yesterday this same man tried to sell his wares to another physician who was wise enough not to buy. This man used my name as a customer and it is evident that he is plying his trade among the physicians of the Back Bay, and I write this letter that you may warn your readers that his wares are not what he claims them to be.

PHYSICIAN.

SOCIETY NOTICES.

AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.—The annual meeting of the American Electro-Therapeutic Association will be held at Battle Creek, Mich., September 15, 16, and 17, 1914.

J. W. TRAVELL, M.D., *Secretary.*

APPOINTMENTS.

UNIVERSITY OF LIVERPOOL.—*Dr. J. S. Macdonald*, of Sheffield, England, has been appointed Holt professor of physiology.

UNIVERSITY OF LONDON.—*Mr. T. B. Johnston, M.B.*, of Edinburgh, has been appointed lecturer and demonstrator in anatomy.

RECENT DEATHS.

DR. GEORGE HARKNESS PAYNE, who died on Aug. 5 at Medford, Mass., was born in 1840, and in 1875 received the degree of M.D. from the Boston University Medical School. He was a member of the Massachusetts Surgical and Gynecological Society, and made a specialty of rhino-laryngology.

SIR CHRISTOPHER NIXON, M.D., ex-president of the Royal College of Physicians of Ireland, died recently at the age of 65.

DR. E. F. ARNOLD of New York, a graduate of the medical department of New York University in the class of 1885, died at Londonderry, Vt., on August 11.

DR. CLEVELAND S. STILWELL, a retired physician and prominent citizen of Sag Harbor, Long Island, N. Y., died suddenly from cardiac disease on August 6. He was 61 years of age.

DR. ROBERT FRANCIS GIBSON of West Somerville, a Fellow of The Massachusetts Medical Society, died at Hill, N. H., August 15, aged 40 years. He was a graduate of the Harvard Medical School in the class of 1901.

DR. DANIEL CAMPBELL ROSE, for thirty-six years town and school physician of Stoughton, died at his home August 15, aged 75 years. He was graduated from the Harvard Medical School in 1869 and was a native of St. James, N. B. He is survived by two daughters.

BOOKS AND PAMPHLETS RECEIVED.

What is a Safe Drinking Water? By Allan J. McLaughlin. Reprint No. 204 from the Public Health Reports. June 26, 1914.

Annual Report of the Department of Health of the City of Buffalo, N. Y., for the Year ending December 31, 1913.

The Twenty-fourth Annual Report of the Eye, Ear, Nose and Throat Hospital, 1913. New Orleans, La.